Vol. 1100 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

March 14, 1989

U.S.
DEPARTMENT
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Patent
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PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

March 14, 1989 Volume 1100 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
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GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Oct. 1, 1988, and was announced in the *Official Gazette* at 1094 O.G. 2 on Sept. 6, 1988.

Domestic PCT fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

International PCT Chapter II fees which were effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987. The elimination of multiple handling fees and the supplement to the handling fee under PCT Rule 57 was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Japanese declaration under PCT Article 64(2)(a), concerning the requirement for a Japanese translation of the international application within 20 months from the priority date when Japan is elected under PCT Chapter II, as from Dec. 8, 1987, was announced at 1085 O.G. 34 on Dec. 22, 1987.

The withdrawal of the Danish declaration under PCT Article 64 (1)(a), that Denmark shall not be bound by PCT Chapter II, as from Nov. 1, 1988, was announced at 1095 O.G. 2 on Oct. 4, 1988.

The withdrawal of the Norwegian declaration under PCT Article 64(1)(a), that Norway shall not be bound by PCT Chapter II, as from Jan. 1, 1989, was announced at 1096 O.G. 34 on Nov. 22, 1988.

National stage fees effective July 1, 1987, for entering the U.S. Patent and Trademark Office as a designated or elected Office were changed effective July 1, 1987, and were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1160.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee per country or region for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	150.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

Oct. 26, 1988.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct.

5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on March 11, 1986 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,574,396 through 4,575,870
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on March 9, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,318,189 through 4,319,360
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and 7 years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant . . . $ 445.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 445.00
By other than a small entity . . . . . $ 890.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED DECEMBER 25, 1988, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,489,446	06/398,084	12/25/84
4,489,447	06/426,101	12/25/84
4,489,451	06/422,074	12/25/84
4,489,454	06/394,776	12/25/84
4,489,456	06/422,902	12/25/84
4,489,463	06/478,259	12/25/84
4,489,464	06/396,071	12/25/84
4,489,465	06/498,725	12/25/84
4,489,495	06/422,877	12/25/84
4,489,502	06/438,973	12/25/84
4,489,510	06/414,943	12/25/84
4,489,512	06/429,174	12/25/84
4,489,520	06/288,657	12/25/84
4,489,526	06/473,237	12/25/84
4,489,528	06/409,321	12/25/84
4,489,531	06/451,992	12/25/84
4,489,541	06/505,698	12/25/84
4,489,542	06/452,720	12/25/84
4,489,544	06/521,110	12/25/84
4,489,547	06/400,606	12/25/84
4,489,550	06/458,063	12/25/84
4,489,561	06/428,651	12/25/84
4,489,564	06/488,264	12/25/84
4,489,586	06/241,689	12/25/84
4,489,595	06/479,170	12/25/84
4,489,597	06/512,024	12/25/84
4,489,599	06/474,049	12/25/84
4,489,602	06/440,402	12/25/84
4,489,603	06/415,546	12/25/84
4,489,605	06/453,600	12/25/84
4,489,607	06/497,043	12/25/84
4,489,627	06/342,278	12/25/84
4,489,628	06/405,392	12/25/84
4,489,633	06/304,654	12/25/84
4,489,641	06/232,746	12/25/84
4,489,643	06/226,737	12/25/84
4,489,649	06/547,127	12/25/84
4,489,656	06/468,422	12/25/84
4,489,657	06/347,685	12/25/84
4,489,665	06/590,119	12/25/84
4,489,666	06/590,144	12/25/84
4,489,678	06/486,232	12/25/84
4,489,682	06/301,039	12/25/84
4,489,695	06/343,365	12/25/84

Patent Number	Serial Number	Issue Date
4,489,700	06/420,974	12/25/84
4,489,703	06/451,243	12/25/84
4,489,715	06/408,225	12/25/84
4,489,716	06/549,313	12/25/84
4,489,717	06/396,114	12/25/84
4,489,732	06/420,404	12/25/84
4,489,737	06/335,655	12/25/84
4,489,738	06/472,955	12/25/84
4,489,747	06/375,392	12/25/84
4,489,766	06/426,760	12/25/84
4,489,767	06/383,319	12/25/84
4,489,776	06/516,696	12/25/84
4,489,780	06/529,561	12/25/84
4,489,781	06/507,889	12/25/84
4,489,789	06/383,967	12/25/84
4,489,792	06/268,053	12/25/84
4,489,793	06/376,340	12/25/84
4,489,804	06/457,129	12/25/84
4,489,808	06/544,521	12/25/84
4,489,809	06/455,290	12/25/84
4,489,813	06/345,115	12/25/84
4,489,816	06/364,424	12/25/84
4,489,831	06/589,891	12/25/84
4,489,833	06/400,297	12/25/84
4,489,836	06/338,869	12/25/84
4,489,845	06/491,209	12/25/84
4,489,848	06/372,647	12/25/84
4,489,851	06/503,669	12/25/84
4,489,865	06/561,948	12/25/84
4,489,866	06/552,109	12/25/84
4,489,868	06/569,386	12/25/84
4,489,874	06/417,151	12/25/84
4,489,876	06/481,142	12/25/84
4,489,884	06/429,271	12/25/84
4,489,889	06/439,706	12/25/84
4,489,893	06/498,363	12/25/84
4,489,897	06/471,309	12/25/84
4,489,903	06/435,402	12/25/84
4,489,907	06/391,459	12/25/84
4,489,911	06/468,142	12/25/84
4,489,912	06/247,804	12/25/84
4,489,915	06/417,527	12/25/84
4,489,926	06/415,972	12/25/84
4,489,928	06/418,683	12/25/84
4,489,932	06/435,944	12/25/84
4,489,937	06/407,745	12/25/84
4,489,938	06/506,016	12/25/84
4,489,940	06/428,154	12/25/84
4,489,944	06/530,711	12/25/84
4,489,959	06/360,161	12/25/84
4,489,961	06/485,761	12/25/84
4,489,962	06/421,821	12/25/84
4,489,965	06/443,380	12/25/84
4,489,968	06/303,781	12/25/84
4,489,969	06/428,723	12/25/84
4,489,972	06/366,201	12/25/84
4,489,974	06/423,677	12/25/84
4,489,975	06/416,388	12/25/84
4,489,994	06/475,153	12/25/84
4,489,997	06/358,092	12/25/84
4,490,002	06/445,887	12/25/84
4,490,003	06/338,358	12/25/84
4,490,013	06/370,287	12/25/84
4,490,018	06/440,614	12/25/84
4,490,023	06/320,056	12/25/84
4,490,024	06/372,675	12/25/84
4,490,031	06/418,578	12/25/84
4,490,040	06/376,757	12/25/84
4,490,046	06/339,186	12/25/84
4,490,051	06/550,626	12/25/84
4,490,056	06/421,462	12/25/84
4,490,063	06/347,324	12/25/84
4,490,071	06/459,707	12/25/84
4,490,078	06/389,444	12/25/84
4,490,083	06/296,574	12/25/84
4,490,088	06/361,044	12/25/84
4,490,097	06/517,325	12/25/84
4,490,104	06/443,837	12/25/84
4,490,108	06/475,060	12/25/84
4,490,109	06/496,969	12/25/84
4,490,113	06/574,022	12/25/84
4,490,122	06/266,513	12/25/84
4,490,123	06/443,179	12/25/84
4,490,137	06/428,831	12/25/84
4,490,142	06/525,119	12/25/84
4,490,150	06/463,461	12/25/84
4,490,155	06/524,004	12/25/84
4,490,157	06/456,653	12/25/84
4,490,161	06/448,740	12/25/84
4,490,169	06/545,681	12/25/84
4,490,173	06/555,716	12/25/84
4,490,183	06/413,327	12/25/84
4,490,204	06/455,470	12/25/84
4,490,212	06/531,687	12/25/84
4,490,213	06/487,262	12/25/84
4,490,228	06/474,670	12/25/84
4,490,233	06/490,878	12/25/84
4,490,236	06/489,150	12/25/84
4,490,237	06/510,289	12/25/84
4,490,244	06/534,489	12/25/84
4,490,247	06/414,350	12/25/84
4,490,250	06/589,022	12/25/84
4,490,252	06/227,930	12/25/84
4,490,259	06/428,776	12/25/84
4,490,282	06/467,958	12/25/84
4,490,312	06/409,541	12/25/84
4,490,335	06/403,871	12/25/84
4,490,341	06/528,491	12/25/84
4,490,345	06/586,155	12/25/84
4,490,351	06/358,055	12/25/84
4,490,363	06/508,140	12/25/84
4,490,375	06/442,683	12/25/84
4,490,383	06/448,240	12/25/84
4,490,390	06/399,968	12/25/84
4,490,414	06/493,507	12/25/84
4,490,422	06/454,711	12/25/84
4,490,433	06/496,060	12/25/84
4,490,461	06/512,823	12/25/84
4,490,482	06/545,259	12/25/84
4,490,487	06/558,668	12/25/84
4,490,498	06/458,361	12/25/84
4,490,509	06/396,162	12/25/84
4,490,524	06/460,443	12/25/84
4,490,550	06/504,695	12/25/84
4,490,571	06/539,208	12/25/84
4,490,583	06/611,382	12/25/84
4,490,586	06/419,526	12/25/84
4,490,591	06/448,591	12/25/84
4,490,614	06/373,431	12/25/84
4,490,615	06/316,741	12/25/84
4,490,636	06/523,156	12/25/84
4,490,642	06/397,186	12/25/84
4,490,646	06/379,636	12/25/84
4,490,649	06/435,520	12/25/84
4,490,651	06/447,674	12/25/84
4,490,656	06/509,482	12/25/84
4,490,659	06/540,738	12/25/84
4,490,663	06/392,889	12/25/84
4,490,677	06/429,858	12/25/84
4,490,679	06/406,618	12/25/84
4,490,694	06/402,630	12/25/84
4,490,742	06/371,198	12/25/84
4,490,745	06/402,143	12/25/84
4,490,757	06/416,254	12/25/84
4,490,764	06/376,685	12/25/84
4,490,770	06/269,571	12/25/84
4,490,772	06/503,875	12/25/84
4,490,777	06/277,179	12/25/84
4,490,779	06/357,892	12/25/84
4,490,798	06/331,250	12/25/84
4,490,816	06/424,081	12/25/84
4,490,825	06/424,572	12/25/84
4,490,827	06/514,573	12/25/84
4,490,829	06/445,646	12/25/84
4,490,832	06/397,043	12/25/84
4,490,834	06/404,695	12/25/84
4,490,835	06/421,398	12/25/84
4,490,851	06/369,045	12/25/84

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,615,620, Re. S.N. 254,964, Filed Oct. 7, 1988, Cl. 356/378, APPARATUS FOR MEASURING THE DEPTH OF FINE ENGRAVED PATTERNS, Minori Noguchi, et al., Owner of Record: *Hitachi Ltd., Tokyo, Japan,* Attorney or Agent: Melvin Kraus, Ex. Gp.: 255

4,618,148, Re. S.N. 291,248, Filed Dec. 28, 1988, Cl. 273/73C, RACQUETBALL RACQUET WITH INCREASED HITTING AREA, Raymond L. Mortvedt, Owner of Record: *Inventor,* Attorney or Agent: Edwin W. Oldham, Ex. Gp.: 334

4,626,012, Re. S.N. 278,289, Filed Nov. 30, 1988, Cl. 294/81.3, LOAD POSITIONER, Gary Weldele, Owner of Record: *Inventor,* Attorney or Agent: Howard A. Kenyon, Ex. Gp.: 312

4,633,748, Re. S.N. 291,435, Filed Dec. 28, 1988, Cl. 84/1.01, ELECTRONIC MUSICAL INSTRUMENT, Susumu Takashima, et al., Owner of Record: *Casio Computer Co. Ltd., Tokyo, Japan,* Attorney or Agent: Thomas Langer, Ex. Gp.: 215

4,634,092, Re. S.N. 293,198, Filed Jan. 4, 1989, Cl. 251/007, CLAMP VALVES, Michael G. Daniell, Owner of Record: *Fisher & Paykel Ltd., Auckland, New Zealand,* Attorney or Agent: David W. Selesnick, Ex. Gp.: 347

4,684,268, Re. S.N. 292,996, Filed Jan. 3, 1989, Cl. 384/574, ROLLER BEARING CAGE, Anders Sahlgren, et al., Owner of Record: *Aktiebolaget SKF., Goteborg, Sweden,* Attorney or Agent: Eugene E. Renz, Jr., Ex. Gp.: 245

4,716,666, Re. S.N. 281,630, Filed Dec. 9, 1988, Cl. 37/135, WEAR RUNNER FOR EXCAVATING BUCKET, Jamer T. Potter, Owner of Record: *Esco Corp., Portland, Oreg.,* Attorney or Agent: Jerome F. Fallon, Ex. Gp.: 337

4,734,106, Re. S.N. 286,367, Filed Dec. 19, 1988, Cl. 55/16, GAS SEPARATING, Arye Z. Gollan, Owner of Record: *A/G Technology Corp., Needham, Mass.,* Attorney or Agent: Charles Hieken, Ex. Gp.: 135

4,740,638, Re. S.N. 292,348, Filed Dec. 30, 1988, Cl. 568/832, CYCLIC HYDROXY COMPOUNDS, Stephen C. Taylor, et al., Owner of Record: *Imperial Chemical Industries PLC., London, England,* Attorney or Agent: Paul N. Kabulis, Ex. Gp.: 120

4,754,293, Re. S.N. 294,099, Filed Jan. 6, 1989, Cl. 346/160, ELECTRO PHOTOGRAPHIC TYPE IMAGE FORMING APPARATUS, Hiroyuki Aizawa, et al., Owner of Record: *Seiko Epson Corp., Tokyo, Japan,* Attorney or Agent: Blum Kaplan, Ex. Gp.: 210

4,754,293, Re. S.N. 294,100, Filed Jan. 6, 1989, Cl. 346/160, ELECTRO PHOTOGRAPHIC TYPE IMAGE FORMING APPARATUS, Hiroyuki Aizawa, et al., Owner of Record: *Seiko Epson, Tokyo, Japan,* Attorney or Agent: Blum Kaplan, Ex. Gp.: 210

4,754,293, Re. S.N. 294,149, Filed Jan. 6, 1989, Cl. 346/160, ELECTROPHOTOGRAPHIC TYPE IMAGE FORMING APPARATUS, Hiroyuki Aizawa, et al., Owner of Record: *Seiko Epson, Tokyo, Japan,* Attorney or Agent: Michael I. Wolfson, Ex. Gp.: 211

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,783,703, Reexam. No. 90/001,699, Requested: Jan. 26, 1989, Cl. 74/157, RATCHET MECHANISM, Lester B. Trimble, et al., Owner of Record: *Easco Hand Tools Inc., Lancaster, Pa.,* Attorney or Agent: Unknown, Ex. Gp.: 350, Requester: Owner

4,495,293, Reexam. No. 90/001,697, Requested: Jan. 23, 1989, Cl. 436/172, FLUOROMETRIC ASSAY, Mark R. Shaffer, Owner of Record: *Abbott Laboratories, Chicago, Ill.,* Attorney or Agent: Martin L. Katz, Ex. Gp.: 130, Requester: Pretty, Schroeder, et al., Los Angeles, Calif.

4,529,841, Reexam. No. 90/001,698, Requested: Jan. 25, 1989, Cl. 179/18, INTERCEPT INFORMATION DISPLAY FOR A PRIVATE AUTOMATIC BRANCH EXCHANGE TELEPHONE SYSTEM, Jan Andersson, et al., Owner of Record: *Inventors, Bromma, Sweden,* Attorney or Agent: Burns, Doane, et al., Ex. Gp.: 260, Requester: Owner

4,611,104, Reexam. No. 90/001,696, Requested: Jan. 25, 1989, Cl. 200/43.80, ELECTROMECHANICAL SWITCH ACTUATOR HAVING HIGH SECURITY KEY ACTUATOR, Redreddy S. Reddy, Owner of Record: *Vapor Corp., Chicago, Ill.,* Attorney or Agent: Fitch, Even, et al., Ex. Gp.: 240, Requester: Westcode Inc., Frazer, Pa.

Patents Available for License or Sale

4,135,596. HOSE TRAY FOR LIQUID TRANSPORTER. *Glen R. Silba,* R.R. 7, Box 357A, Springfield, Mo. 65802.

4,185,407. DISPLAY DEVICE ELECTRIC OR BATTERY RUN. *Jack W. Lamb,* 10822 Magnolia Blvd. #142, North Hollywood, Calif. 91601.

4,266,112. WEB-CUTTING PROCESS. *William P. Niedermeyer,* 1024 Mt. Mary Dr., Green Bay, Wis. 54301.

4,473,244. FREEZE RESISTANT HOSE BIB RECEPTACLE. David L. Garrison, Garrison & Stratton P.S., 2100 Fifth Ave. Bldg., Seattle, Wash. 98121.

4,505,902. SKIN TREATMENT PREPARATION. *Alice Millard,* 2068 Belover Dr. Memphis, Tenn. 38127.

4,497,854. ARTIFICIAL CROSS-COUNTRY SKI SURFACE. *John R. Mykrantz,* 6510 Page Blvd., St. Louis, Mo. 63133.

4,576,178. AUDIO SIGNAL GENERATOR. Guy W. Shoup, Wyatt, Gerber, Shoup & Badie, One Rockefeller Plz., New York, N. Y. 10020.

4,653,428. SELECTIVE CHEMICAL VAPOR DEPOSITION. Margaret M. Fahey, Washington Patent Operation, General Electric Co., 2001 Jefferson Davis Hwy., Arlington, Va. 22202.

4,702,704. TETRAHEDRAL CODON STEREO-TABLE. Leonard R. Svensson, Birch, Stewart, Kolasch & Birch, P. O. Box 747, Falls Church, Va. 22046.

4,757,485. COMPOSITE WRIST WATCH. *Alan Young* , G.P.O. Box 6746, Hong Kong.

4,792,399. LIQUID COLLECTING AND RETAINING DEVICE. *Kyle Haney,* P. O. Box 16741, Atlanta, Ga. 30321.

4,797,671. MOTOR VEHICLE LOCATOR SYSTEM. *R. Peter Toal, Jr.,* 3545 Carman Rd., Schenectady, N.Y. 12303.

07/158,398. ELECTRONIC DIGITAL DICE II. *Glenn E. Simpson*, 204 N. 3rd St., Libertyville, Ill. 60048.
07/267,281. RESIN-COMPOSITE PANEL AND PROCESS OF MAKING. *Bill Thornton*, 204 Ella St., Lafayette, La. 70506.
07/267,282. LOCK-STEP DUO STEPT SPLIT SEALING RING. *Bill Thornton*, 204 Ella St., Lafayette, La. 70506.

Erratum

"All reference to Patent No. 4,802,963 to Mirza M. T. Khan, et al., of India for 'PROCESS FOR THE PHOTOCATALYTIC DECOMPOSITION OF WATER INTO HYDROGEN AND OXYGEN' appearing in the Official Gazette of Feb. 7, 1989 should be deleted since no patent was granted."

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Bankcom Corp., Schiller Park, Ill., Reg. No. 1,009,715, for the mark "INTER-NET" and design, Canc. No. 17,218.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For JEFFREY M. SAMUELS,
Assistant Commissioner
for Trademarks.

U.S. Department of Commerce
Patent and Trademark Office

[Docket No. 90126-9026]

Notice of Establishment and Solicitation for Board Members for the Biotechnology Institute

Agency: Patent and Trademark Office, Commerce
Action: Notice of establishment of Biotechnology Institute and solicitation for Board Members for the Institute.
Summary: Biotechnology is a rapidly emerging field of endeavor. As a consequence, the Patent and Trademark Office is experiencing a significant growth in patent application filing activity in this and related arts. The immense volume of filing and newness of the technology have created problems for the Patent and Trademark Office in the assimilation of large numbers of newly hired examiners and the retrieval and acquisition of the most pertinent prior art, primarily non-patent literature.

In response to the challenge created by this activity, the Assistant Secretary and Commissioner of Patents and Trademarks, Donald J. Quigg, is establishing a Biotechnolgy Institute which will be a cooperative effort of the PTO, other Government agencies and the private sector. The purpose of this Institute is to provide examiners with better resources to keep current in the legal and technological issues involved in biotechnology patent examination. Working with trade and bar associations, academia, and other Government agencies, the PTO will, through the establishment of this Institute, provide state-of-the-art knowledge to examiners through an enhanced training program.

In order to accomplish this goal the Assistant Secretary and Commissioner has decided to set up a board of interested people from the Government, academia and trade and bar associations. The purpose of this Board is to assist the PTO in identifying technology trends and training expertise for the Institute.
Addresses: Parties interested in having representatives on this Board should address their name request to the Commissioner of Patents and Trademarks; Washington, D.C. 20231; Attention: John E. Kittle, Director, Group 180 by Mar. 31, 1989. The first meeting of the Board will be held on Apr. 18, 1989, at 10:00 a.m. in Room 912, on the 9th floor of Crystal Park, Bldg. 2, located at 2121 Crystal Dr., Arlington, Va.
For Further Information Contact: John E. Kittle, Director, Group 180, by telephone at (703) 557-3637, or by mail to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: Biotechnology is a rapidly emerging field of endeavor. As a consequence, the Patent and Trademark Office is experiencing a significant growth in patent application filing activity in this and related arts. The immense volume of filings and unusually rapid development of the technology have created problems for the Patent and Trademark Office in the assimilation of large numbers of newly hired examiners and the retrieval and acquisition of the most pertinent prior art, primarily non-patent literature.

In response to the challenges created by this activity, the Assistant Secretary and Commissioner of Patents and Trademarks implemented a 13-point plan to reduce pendency and improve examination quality in the Biotechnology area. One of the first measures undertaken in his plan was the formation of a new patent examining group, Group 180, which consolidated into a single group all of the various arts which comprise biotechnology. To keep pace with the patent activity in this area, large numbers of new examiners have and will be hired into the new group. Further, other chemical examining groups will help train new examiners for the new group. These examiners, after their training period, will be reassigned to the new group. In addition, specifically identified experienced examiners from other chemical examining groups will be retrained to provide assistance in examining biotechnology inventions.

Six points in the "13-point plan" cover training and access to search tools needed to examine biotechnology inventions in an effective and efficient manner. To address these needs in a systematic way, a Biotechnology Institute will be created. The purpose of the Institute will be to enhance the quality of the patent examination process in Biotechnology.

The goals of the Biotechnology Institute will be:

(1) education of examiners in the technical and legal aspects of examining biotechnology inventions;
(2) improvement of internal and external communication of technical and legal information between the examining corps and the public; and
(3) development of search tools which will improve the effectiveness and efficiency of the patent examination process in biotechnology

Major participants in the program from within the Patent and Trademark Office are the Patent Academy, which serves as the parent organization responsible for coordinating the diverse activities of the Biotechnology Institute; the Scientific Library, which will identify, obtain and catalogue literature relevant to the Biotechnolody examiners' needs; and Group 180, which will provide not only examiners for the education program, but will also provide speakers/educators in specific fields of biotechnology and the law.

Working through trade and bar associations, other Government agencies and academia, the PTO will seek the assistance from the private sector in enhancing examiner education. Help will be sought to obtain state-of-the-art understanding in the biotechnology field.

Currently the Patent Academy provides formal examiner training in the legal, procedural, technical and

search areas to all new and experienced examiners. The examiner training programs under the auspices of the Patent Academy are shown below:

1. The Patent Academy, a 4-phased program, provides new examiners with over 200 hours of mandatory formal training in patent law, practice and procedure during the first year of service.
2. The Law School Tuition Assistance program enables examiners interested in attending law school to receive financial assistance for tuition and books for authorized job-related courses taken in pursuit of a law degree.
3. Tuition assistance for technical courses at local universities is available for examiners to keep up with state-of-the-art graduate level courses in their technologies.
4. Three in-house law courses are provided to examiners after they complete the Patent Academy. The three courses taught at the Patent Academy facilities are: Patent Law, Legal Methods and Evidence.
5. In-house technical courses are also provided through live presentations by outside contractors and via use of videotaped courses facilitated by in-house technical experts.
6. Automated Patent System training is provided to all examiners in Text Search and, in the future, Image Search and Retrieval.
7. Commerical Database training is provided for examiners in specialized arts.
8. Guest speakers in legal and technical areas provide short subject presentations within the framework of the legal lecture series and the Patent and Trademark Office Society educational program.

The Biotechnology Institute will build upon these current structures to increase legal and technical knowledge among the biotechnology examiners.

PARTICIPANTS:

Participants in the training aspects of the Institute will be drawn from Group 180 and selected individuals from the Board of Patent Appeals and Interferences and the Office of Quality Review. In selected instances, trainees may be drawn from other examining groups. Supervisors will develop an individual training plan for each of their examiners that takes into consideration the education, background and experience of the individual in comparison to specific work needs. In this way, individual developmental needs will be identified so that appropriate training can be strategically planned for succeeding years. General needs of all the examiners will also be addresed.

Selection for training opportunities will be determined by giving priority to needs identified in the individual training plans and to general technical and legal update needs.

PROGRAM SCOPE:

The Biotechnology Institute will include adaptations of current Academy programs and PTO training policy and the introduction of intensive legal and technology training in the biotechnology area. The following are adaptations of current PTO training policy and proposed new programs for which we would like to have industry and other outside assistance.

1. An expanded Patent Examiner Initial Training (*PEIT*) Program.

   PEIT is the initial first two weeks of formal training in examination practice and procedure given to all new examiners. This program wil be *augmented* to meet the specific initial needs of biotechnology examiners.
2. A specifically designed *patent law class*, taught by an attorney with a biotechnology background, will be presented to all new biotechnolgy patent examiners between phase II and III of the Patent Academy, (3-6 months after coming on board). This course will focus on special issues and fact situations arising in the examination of patent applications in this field.
3. *Text search*, training in the Automated Patent System (APS) will be given within a few weeks after completing the PEIT. Additionally, biotechnology examiners will be given access to early training on biotechnolgy related commerical databases.
4. The examiners in Group 180 will continue to conduct weekly, *lunchtime* training sessions. This program offers an opportunity for examiners to share with each other their technical and legal knowledge needed in the examination of biotechnology patent applications.
5. *Seminars* and *lectures* will be provided on technical and legal issues through a cooperative effort of the PTO with other Government agencies and industry associations.
6. A week-long *transition* program will be conducted for experienced patent examiners transferring into the biotechnology area through a cooperative effort with other Government agencies and industry associations.
7. A *one-day seminar* dealing with the realities of biotechnology research will be presented through a cooperative effort with other Government agencies and industry associations.
8. A *one-day seminar* will be conducted each year, to *update examiners* on significant technological advances which occurred during the year through a cooperative effort with other Government agencies and industry associations.
9. Assistance will be provided to the PTO by outside sources to identify *facilities to be visited*, and points of contact, that would be most beneficial for examiners in arranging trips under the Examiner Education Program.
10. Round Table discussions with members of bar associations will continue to ensure that general biotechnology legal and practice issues of mutual concern are discussed.

The Institute, a cooperative effort of Government and bar and trade associations, will be established to provide examiners with the necessary resources to keep current on law and technology. Government agencies and trade associations such as the Industrial Biotechnology Association, Association of Biotechnolgy Companies, the Pharmaceutical Manufacturers Association, the Intellectual Property Owners, American Society of Microbiologists, American Association for Advancement of Science, American Chemical Society and other associations in the biotechnology field, and bar associations such as American Intellectual Property Law Association, American Bar Association, etc., will be invited to provide the technical and legal resources needed to design and present training courses and provide the PTO with general reference materials. These associations will provide the authorities in the field who will assist with the training of biotechnology patent examiners. The Industrial Biotechnology Association has already offered to help with the Institute.

A board of association, Government and academic representatives will assist the PTO in the identification of Institute needs and provide resources for the program implementation of this Institute. The board will initially meet in the near future. The Institute will utilize the board to identify future technological trends where training will be needed, identify sources of technical and legal expertise and effectuate the cooperation necessary to provide the teaching and other assistance required.

A notice will be published in the Federal Register inviting academic and bar and trade associations support the Institute. The involvement of bar and industry groups will be strictly limited to assistance in identifying needs, identifying and providing training expertise, helping contact and provide teaching resources and donations of general

reference materials. No contacts with the private sector will involve patent applications or patents or their processing in any way. General policy issues will not be resolved or decided in the Institute program.

PROGRAMS FOR FY 1989:

What	*Who*	*When*
Implemetion of augmented PEIT	PTO	Fall/Winer 1988
Inclusion of Biotechnology Patent Law Class	PTO	Spring 1989
Accelerated Schedule of training for Goup 180 examiners an APS and Commerical Databases	PTO	Summer/Fall 1988
Selected lectures from guest speakers on technology issues	PTO/ Assocs.	Continuing
One week program to introduce transferred/new examiners to biotechnology	IBA/ PTO	Winter 1988/ Spring 1989
Seminar on realities of biotechnology research	IBA/ PTO	Spring 1989
Update seminar of significant technology changes in past year	IBA/ PTO	Summer 1989
Round Table discussions with members of Bar Associations	PTO/ Bar Assoc.	Continuing
Meeting with the Institute board to evaluate program progress and discuss plans and needs for the future.	PTO/ Advisory	Summer 1989

Feb. 16, 1989.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

NOTICE OF AUTOMATED PATENT SYSTEM (APS) TEXT SEARCH TRAINING FOR PUBLIC USERS

In accordance with the Patent and Trademark Office's (PTO) desire to further the interests of technology and innovation, the capability of searching patents in text form which is now available to PTO examiners will be made available to the public.

Text training classes similar to those offered to the PTO examiners will be made available to the public. These classes will consist of both traditional classroom instruction and "hands on" practice using APS terminals. All major capabilities of the Automated Patent System's Text Search features will be covered. Classes will be held at the PTO located in Arlington, Virginia.

These classes will be offered *free* to the public. The classes will be divided into four sessions of three and one-half hours each. Space in each weekly session will be limited to 10 persons. A lottery-type drawing will be held to determine specific class assignments.

All completed applications received on or before March 21, 1989 will be included in the first lottery for classes beginning March 27, 1989. Applications received after March 21, 1989 and before April 28, 1989 will be included in a second lottery for class assignments. Invitations to apply for subsequent lotteries will be posted periodically as demanded requires.

An application form for text search training must include *all* information shown below.

PATENT AND TRADEMARK OFFICE
AUTOMATED PATENT SYSTEM (APS)
APPLICATION FORM FOR TEXT SEARCH TRAINING

NAME: _____
FIRST LAST MI

MAILING ADDRESS: _____

_____

_____

PHONE NUMBER: _____ _____
(AREA CODE)

EMPLOYER: _____

PLEASE FORWARD APPLICATION TO THE FOLLOWING ADDRESS:

Commissioner of Patents and Trademarks
Box: PSSD
Washington, D.C. 20231

Can be facsimile transmitted to (703) 557-6369.

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

Mar. 3, 1989

NOTICE OF AUTOMATED TRADEMARK SYSTEM (T-SEARCH) TRAINING FOR PUBLIC USERS

In accordance with the Patent and Trademark Office's (PTO) desire to further the interests of technology and innovation, the capability of searching trademarks in automated form which is now available to PTO examiners will be made available to the public.

Training classes similar to those offered to the PTO examiners will be made available to the public. These classes will consist of both traditional classroom instruction and "hands on" practice using T-Search terminals. All major capabilities of T-Search will be covered. Classes will be held at the PTO located in Arlington, Virginia.

These classes will be offered *free* to the public. Each class will last four hours. Space in each session will be limited. A lottery-type drawing will be held to determine specific class assignments.

All completed applications received on or before March 21, 1989 will be included in the first lottery for classes beginning March 27, 1989. Applications received after March 21, 1989, and before April 28, 1989 will be included in a second lottery for class assignments. Invitations to apply for subsequent lotteries will be posted periodically as demanded requires.

An application form for T-Search training must include *all* information shown below.

PATENT AND TRADEMARK OFFICE
AUTOMATED TRADEMARK SYSTEM (T-SEARCH)
APPLICATION FORM FOR TRAINING

NAME: _____
FIRST LAST MI

MAILING ADDRESS: _____

_____

_____

PHONE NUMBER: _____ _____
(AREA CODE)

EMPLOYER: _____

PLEASE FORWARD APPLICATION TO THE FOLLOWING ADDRESS:

Commissioner of Patents and Trademarks
Box: PSSD
Washington, D.C. 20231

Can be facsimile transmitted to (703) 557–6369.

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

Mar. 3, 1989

PATENT NOTICES

Certificates of Correction for the Week of Mar. 14, 1989

D. 292,975	4,744,951	4,764,259	4,776,970
D. 296,821	4,745,426	4,764,267	4,777,051
D. 296,974	4,746,605	4,764,528	4,777,151
D. 297,403	4,746,729	4,764,790	4,777,318
D. 298,160	4,749,864	4,765,839	4,777,931
D. 298,268	4,749,967	4,765,917	4,778,101
D. 298,459	4,751,983	4,766,029	4,778,103
4,385,179	4,752,285	4,766,184	4,778,262
4,506,575	4,752,665	4,766,585	4,778,574
4,541,033	4,752,787	4,767,406	4,778,590
4,578,406	4,754,200	4,767,463	4,778,592
4,579,726	4,755,497	4,767,738	4,778,649
4,588,461	4,755,537	4,767,770	4,778,696
4,638,890	4,755,824	4,768,031	4,778,792
4,651,926	4,756,243	4,768,122	4,779,009
4,656,859	4,756,523	4,768,176	4,779,012
4,657,970	4,756,954	4,768,177	4,779,166
4,659,429	4,757,560	4,768,241	4,779,357
4,659,850	4,757,718	4,768,482	4,779,706
4,668,922	4,758,071	4,768,766	4,780,001
4,672,842	4,758,349	4,769,028	4,780,118
4,677,614	4,758,502	4,769,653	4,780,213
4,684,493	4,758,697	4,770,042	4,780,328
4,686,140	4,758,929	4,770,043	4,780,354
4,688,423	4,759,267	4,770,820	4,780,364
4,688,638	4,759,287	4,771,162	4,780,470
4,692,300	4,759,342	4,771,221	4,780,583
4,693,958	4,759,344	4,771,324	4,780,801
4,699,466	4,759,493	4,771,454	4,781,008
4,699,628	4,759,587	4,771,524	4,781,140
4,705,789	4,759,798	4,771,719	4,781,241
4,707,231	4,759,849	4,771,768	4,781,520
4,712,847	4,760,040	4,773,055	4,781,640
4,716,892	4,760,077	4,773,209	4,781,849
4,718,344	4,760,213	4,773,458	4,781,872
4,721,720	4,760,587	4,773,625	4,781,906
4,721,826	4,760,696	4,773,821	4,782,088
4,724,607	4,761,277	4,773,824	4,782,155
4,726,783	4,761,511	4,773,964	4,782,466
4,727,717	4,761,562	4,774,177	4,782,556
4,731,263	4,761,776	4,774,251	4,782,622
4,731,719	4,761,779	4,774,817	4,782,654
4,733,646	4,762,284	4,774,837	4,782,713
4,734,264	4,762,326	4,774,900	4,782,788
4,734,785	4,762,453	4,775,089	4,782,959
4,734,891	4,762,731	4,775,355	4,783,318
4,736,405	4,762,803	4,775,409	4,783,828
4,737,707	4,762,824	4,775,643	4,783,886
4,739,095	4,762,836	4,776,032	4,783,922
4,740,577	4,762,958	4,776,034	4,784,723
4,740,852	4,763,010	4,776,204	4,785,154
4,742,224	4,763,330	4,776,328	4,785,483
4,743,523	4,763,393	4,776,744	4,786,051
4,744,790	4,763,992	4,776,873	4,797,381

Disclaimers

4,491,526.—*Charles F. Deck*, Trenton, Mich. THICKENED WATER-BASED HYDRAULIC FLUID WITH REDUCED DEPENDENCE OF VISCOSITY ON TEMPERATURE. Patent dated Jan. 1, 1985. Disclaimer filed May 18, 1988, by the assignee, *BASF Corp.*

Hereby enters this disclaimer to claims 1-14 of said patent.

4,788,594.—*Stanford R. Ovshinsky*, Bloomfield Hills; *Lawrence G. Norris*, West Bloomfield, both of Mich. SOLID STATE ELECTRONIC CAMERA INCLUDING THIN FILM MATRIX OF PHOTOSENSORS. Patent dated Nov. 29, 1988. Disclaimer filed Jan. 17, 1989, by the assignee, *Energy Conversion Devices, Inc.*

The term of this patent subsequent to June 23, 2004, has been disclaimed.

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

The following special boxes should be used only for their specified purpose. Address mail as follows:

Box_____
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislation and International Affairs.
Box 5	"No fee" mail related to trademarks.
Box 6	Mail for the Office of Procurement.
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 8	All papers for the Office of the Solicitor except communications relating to pending litigation.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of patent and trademark applications.
Box 11	Electronic Ordering Service (EOS).
Box 12	Contributions to the Examiner Education Program.
Box 13	Mail for the Employee and Labor Relations Division.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box FWC	Requests for File Wrapper Continuation Applications.
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Non Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box OED	Mail for the Office of Enrollment and Discipline.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Mail related to Reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections, which are organized in patent number sequence, are available for use by the public free of charge. Each of the PDLs, in addition, offers supplemental reference publications of the U.S. Patent Classification System, including the *Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions,* and provides technical staff assistance in their use to aid the public, in gaining effective access to information contained in patents. CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data, is available at all PDLs. Facilities for making paper copies of patents from either microfilm or paper collections are generally provided for a fee.

Since there are variations in the scope of patent collec patents from either microfilm or paper collections are generallcontemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
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	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 261-2907
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7140
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3200
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
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Idaho	Moscow: University of Idaho Library	(208) 885-6235
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	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Kentucky	Louisville Free Public Library	(502) 561-8617
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 376
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska—Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada—Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-4412
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 846-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, North Carolina State University	(919) 737-3280
Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 744-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin —Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF February 11, 1988

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director	8-21-86
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-4-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	3-31-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	1-20-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-31-86
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. SHAW, Acting Director	11-24-86
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	12-18-87
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	7-7-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	2-19-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	1-12-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—D. G. KELLY, Director	8-12-87
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	1-20-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	7-22-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-1-88

Expiration of patents: The patents within the range of numbers indicated below expire during February 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,638,239 to 3,646,613, inclusive

Plant Patents ..... None

REISSUES

MARCH 14, 1989

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,886

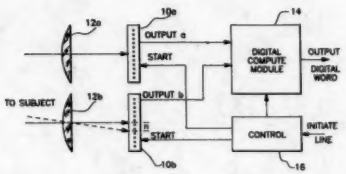
DIGITAL AUTO FOCUS

Norman L. Stauffer, Englewood, Colo., assignor to Honeywell, Inc., Minneapolis, Minn.

Original No. 4,078,171, dated Mar. 7, 1978, Ser. No. 696,170, Jun. 14, 1976. Application for reissue Aug. 5, 1982, Ser. No. 405,487

Int. Cl.[4] G01J *1/20*

U.S. Cl. 250—201 3 Claims



13. Automatic focus control apparatus for use in an optical system including a primary optical means, the automatic focus control apparatus comprising:

[focus detecting means for providing a first digital word indicative of the distance between the focus detecting means and an object;] *a first detector array positioned to receive a first detection image of an object and to provide output signals indicative of the radiation received;*

a second detector array positioned to receive a second detection image of the object and to produce output signals indicative of radiation received, the second detection image being displaced by a number n of detectors in the second detector array with respect to the position of the first detection image on correspohding detectors of the first detector array, the number n being indicative of the distance between the object and the first and second detector arrays;

signal processing means for receiving the output signals from the first and second detector arrays and producing a first digital word indicative of n;

position encoder means for providing a second digital word indicative of the position of the primary optical means;

comparator means for comparing the first and second digital words and providing an output signal indicative of the comparison;

motive means for moving the primary optical means; and

control means for controlling the motive means in response to the output signal of the comparator means.

Re. 32,887

MESSAGE COMMUNICATION METHOD AND SYSTEM

Kinji Mori, Kawasaki; Makoto Nohmi, Sagamihara; Shoji Miyamoto, Kawasaki; Hirokazu Ihara, Machida; Hiroshi Matsumaru, Katsuta, and Katsuki Ikeda, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 45,104,924, dated Apr. 9, 1985, Ser. No. 366,782, Apr. 8, 1982. Application for reissue Apr. 3, 1987, Ser. No. 33,777

Claims priority, application Japan, Apr. 8, 1981, 56-51786

Int. Cl.[4] H04Q *9/00;* H04J *3/08*

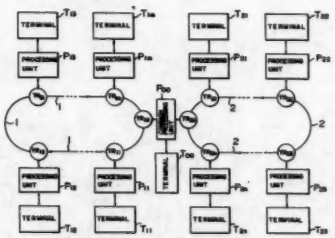
U.S. Cl. 340—825.05 13 Claims

7. A message communication method in a network system including a plurality of communication lines, a plurality of intra-line equipment blocks and at least one common equipment block, each of said intra-line equipment blocks being connected to one of said communication lines, at least a first one of said communication lines being coupled to at least a second one of said communication lines through said common equipment block, each message signal to be communicated via the communication lines including a function code which is an index to the meaning of data required to be processed in at least one of said equipment blocks, the method comprising the steps of:

registering at least a first function code and at least a second function code in said common equipment block, said first and second function codes being indices to the meaning of the data required to be processed in the equipment blocks connected to said communication line and said second communication line, respectively;

sending a message signal from any one of said equipment blocks to the communication line to which it is connected;

receiving message signals in said common equipment block from said coupled communication lines;



comparing in said common equipment block said function code of the received message signals with those ones of said first and second function codes registered in said common equipment block which are indices to the meaning of data required to be processed by at least one of the equipment blocks connected to one of the coupled communication lines with which said sending equipment block is not connected;

transferring the received message from one of said coupled communication lines to the other only when said comparison results are in concurrence; and

receiving a message signal in any of said equipment blocks processing said message signal in said equipment block only when the function codes registered in said receiving equipment block are concurrent with the function code of the message signal on the communication line to which the receiving equipment block is connected.

Re. 32,888

APPARATUS AND METHOD FOR SELECTIVELY ACTIVATING PLURAL ELECTRICAL LOADS AT PREDETERMINED RELATIVE TIMES

Ian J. Kirby, Warrington; Michael L. Mitchell, Chester, and Andrew Stratton, Farnborough, all of England, assignors to Imperial Chemical Industries PLC, London, England

Original No. 4,324,182, dated Apr. 13, 1982, Ser. No. 5,551, Jan. 22, 1979. Application for reissue Feb. 5, 1988, Ser. No. 152,927

Claims priority, application United Kingdom, Feb. 2, 1978, 4057/78

Int. Cl.[4] F42C *11/00*

U.S. Cl. 102—217 62 Claims

39. An electrical timing device for activating an electrical load after a predetermined time delay operating in conjunction with a remote unit which provides accurately timed reference signals, said device comprising:

time interval measuring means adapted to receive said accu-

rately timed reference signals and to measure a first time interval associated therewith, said time interval measuring means comprising

means for providing first and second signals from said time interval,

a source of locally generated clock pulses, and

timing counter means for counting the number of clock pulses occuring between said first and second signals, and

output means for thereafter activating said electrical load after said predetermined time delay, which is *measured from a reference time defined by said timed reference signals and* determined as a function of said measured first time invertal, said output means comprising means for activating the electrical load after a subsequent time delay measured by again counting said clock pulses as a function of the number earlier counted between said first and second signals.

Re. 32,889

THIXOTROPIC CYANOACRYLATE COMPOSITIONS

Alan E. Litke, Naugatuck, Conn., assignor to Loctite Corporation, Newington, Conn.

Original No. 4,477,607, dated Oct. 16, 1984, Ser. No. 528,275, Aug. 31, 1983. Application for reissue Oct. 14, 1986, Ser. No. 918,820

Int. Cl.[4] C08K *9/04, 5/54*

U.S. Cl. 523—212 19 Claims

1. In a composition comprising an α-cyanoacrylate ester monomer and a thixotropic agent, the improvement comprising that said composition is a non-flowable gel, said thixotropic agent is present in an amount of 12% or less and is a fumed silica having a surface treated with a trialkoxyalkylsilane and the said composition has a 2.5 RPM Brookfield viscosity of about 1×10^5 or greater.

PLANT PATENTS

GRANTED MARCH 14, 1989

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,661
ALSTROEMERIA NAMED ZELBLANCA

Gerard J. van Zelderen, Achterweg 34-36, 1424 PR De Kwakel, Netherlands

Filed Sep. 24, 1987, Ser. No. 100,716
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. The new and distinctive Alstroemeria cultivar and parts thereof substantially as herein shown and described, characterized by the pure white coloration of the outer petals of its flowers and the end portions only of the upper pair of the inner petals, the principal body portion of the lower one of the inner petals having a distinctive yellow coloration and the upper ones of the inner petals being heavily marked with dark, longitudinally-extending pencil stripes; and by the very large size of the flowers and the vigorous, upright and tall growth habit of the plant.

6,662
CARNATION NAMED LANARIC

Fernand Lanari, Cagnes-sur-Mer, France, assignor to Selecta Klemm K.G., Stuttgart, Fed. Rep. of Germany

Filed Sep. 24, 1987, Ser. No. 100,718
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—71 **1 Claim**

1. The new and distinctive carnation and parts thereof of the dianthini group, substantially as herein shown and described, characterized by its year around productivity of clean, light pink flowers carried on rigid and erect pedicels and productive of two crops per year.

6,663
DWARF CARNATION PLANT 'SNEFFELS'

Kenneth L. Goldsberry, Fort Collins, Colo., assignor to Colorado State University Research Foundation, Fort Collins, Colo.

Filed Jul. 10, 1987, Ser. No. 71,806
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—71 **1 Claim**

1. A new and distinct cultivar of *Dianthus caryophyllus,* Linn, identified as 83-40-2 and known as Sneffels and substantially as herein described and illustrated.

6,664
ROSE PLANT JACGLOW

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Aug. 3, 1987, Ser. No. 81,434
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct variety of rose plant and parts thereof of the hybrid tea class substantially as herein shown and described, characterized particularly as to novelty by light pink, high centered blooms, heavy flower production on long stems, leathery, dark green foliage, resistance to powdery mildew, and peduncles including glands and prickles.

6,665
ROSE PLANT JACREM

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Aug. 3, 1987, Ser. No. 81,435
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—10 **1 Claim**

1. A new and distinct variety of rose plant and parts thereof of the miniature class substantialy as herein shown and described, characterized particularly as to novelty by bright red flowers, ease of propagation by softwood cuttings, very compact plant habit suitable for four-inch pot plantings, bronze-colored new foliage, resistance to powdery mildew, five to seven leaflet leaves and glands on the petiole edge.

6,666
ROSE PLANT JACSNOW

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Aug. 10, 1987, Ser. No. 84,423
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—1 **1 Claim**

1. A new and distinct variety of rose plant and parts thereof of the shrub class substantially as herein shown and described, characterized particularly as to novelty by upright vigorous habit of growth with ease of propagation as hardwood or softwood cuttings or by budding, clear pure white flowers contrasted by dark green foliage, large stipules and the presence of iarge numbers of glands on stipules, peduncles and sepals.

6,667
ROSE PLANT JACCOB

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Aug. 18, 1987, Ser. No. 87,251
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—17 **1 Claim**

1. A new and distinct variety of rose plant and parts thereof of the hybrid tea class substantially as herein shown and described, characterized particularly as to novelty by an unusual orange and yellow blend flower color, heavy flower production on long stems, presence of large and small prickles on flower stems and presence of prickles on rachis.

6,668
ROSE PLANT JACBOR

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Aug. 18, 1987, Ser. No. 87,252
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—17 **1 Claim**

1. A new and distinct variety of rose plant and parts thereof of the hybrid tea class substantially as herein shown and described, characterized particularly as to novelty by a vigorous upright growth habit, flower color in the Red Group 42B to 42D, seven leaflet leaves, large and small prickles on the lateral branches, prickles and glands on the petioles, and a reddish strip on the otherwise green styles.

6,669
ROSE PLANT SEEDLING NAMED CHARADE

Lowell L. Hoy, Jr., Richmond, Ind., assignor to Joseph H. Hill Company, Richmond, Ind.

Filed Jun. 15, 1987, Ser. No. 61,670
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—28 **1 Claim**

1. The new and distinctive red rose plant and parts thereof, substantially as herein shown and described, characterized by the overall cardinal red flower coloration, its vigorous growth habit, and its free and continuous blooming in greenhouse culture.

6,670

FLORIBUNDA ROSE PLANT CV. ARORESAS

Thomas F. Carruth, Canoga Park, and Jack E. Christensen, Ontario, both of Calif., assignors to Armstrong Roses, Somis, Calif.

Filed Jun. 26, 1987, Ser. No. 67,622
Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—29 **1 Claim**

1. A new and distinct variety of floribunda rose plant cv. Aroresas and the parts thereof, being particularly characterized by its upright habit; its long, flower-bearing stems with very few prickles; and its long lasting, well formed and relatively small flowers of uniform red color, substantially as described and illustrated herein.

6,671

PEACH TREE CALLED VALLEY RED

Paul E. Hansche, Davis, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 9, 1987, Ser. No. 107,140
Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—43 **1 Claim**

1. The new and distinct variety of peach tree herein described and illustrated and identified by the characteristics enumerated above and the parts thereof.

6,672

FLOWERING CRAB APPLE TREE NAMED MAZAM

John L. Fiala, Medina, Ohio, assignor to New Plants, Perry, Ohio

Continuation of Ser. No. 895,800, Aug. 12, 1986. This application Dec. 3, 1987, Ser. No. 129,402
Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct variety of flowering Malus, (crab apple tree), substantially as herein shown and described, characterized particularly by extremely ornamental flowers, a uniquely long period of bud effectiveness, and a dense, upright structure.

6,673

MINIATURE ROSE PLANT/MINADCO

Ernest D. Williams, 1510 Lebanon Ave., Dallas, Tex. 75208

Filed Apr. 29, 1987, Ser. No. 43,815
Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, upright, much branched habit, substantially as illustrated and described, characterized by buds and flower of exhibition form, essentially mauve in color, the petals on outside surface being same as on inside surface, and further characterized by a plant of compact well rounded shape; vigorous, with the main stems and shoots being of average thorniness, the said plant being easy to propagate from cuttings or by budding, with an abundance of flowers borne singly or several to the stem in loose clusters.

6,674

HERITAGE CHESTNUT

Robert D. Wallace, Rte. 1, Box 341, Alachua, Fla. 32615

Filed Apr. 13, 1987, Ser. No. 37,946
Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—30 **1 Claim**

1. A new and distinct variety of hybrid chestnut tree, substantially as illustrated and described, which is of large size, vigorous, upright, straight-boled, timber type form with large, elliptical leaves with deeply dentate margins and late (post leaf appearance) flowering; the tree being a light, regular bearer of medium sized, elongated, sweet nuts in burrs that crack in late September and early October and release the crop easily; the trees being especially characterized by resembling the American chestnut in tree form, foliage and nut quality and a high genetic resistance to the chestnut bark blight.

6,675

NECTARINE TREE (SPARKLING MAY)

Norman G. Bradford, 11875 E. Savana Rd., and Lowell G. Bradford, 12439 E. Savana Rd., both of Le Grand, Calif. 95333

Filed Nov. 16, 1987, Ser. No. 122,267
Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct early ripening variety of freestone nectarine tree, substantially as illustrated and described, which most nearly resembles the May Diamond (U.S. Plant Pat. No. 5,454) variety but is distinguished from and an improvement on that variety by ripening seven days earlier, by having a sweeter less acidic flavor, and by blooming more densely the fruit has average size, good flavor, good firmness, and excellent shape for the commercial grower also, the fruit harvests in California at a very desirable time period, approximately halfway between Early Diamond (U.S. Plant Pat. No. 5,438) and May Diamond (U.S. Plant Pat. No. 5,454).

6,676

CHERRY TREE NAMED BROOKS

Paul E. Hansche, Davis, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 9, 1987, Ser. No. 107,135
Int. Cl.[4] A01H *5/03*

U.S. Cl. Plt.—37 **1 Claim**

1. I claim the new and distinct variety of Cherry Tree having the characteristics described and illustrated herein and the parts thereof.

PATENTS

GRANTED MAR 14, 1989

ERRATA

For CLASS	See PATENT NO.
098-041	4,811,575
081-125	4,811,647
074-331	4,811,655
119-052	4,811,675
016-097	4,811,683
052-309	4,811,770
070-016	4,811,775
144-357	4,811,776
169-062	4,811,796
184-003	4,811,818
232-035	4,811,895
493-213	4,812,074
414-199	4,812,092
149-019	4,812,179
149-019	4,812,180
101-375	4,812,219
562-470	4,812,476
585-467	4,812,536
514-307	4,812,573
523-107	4,812,598
303-014	4,812,777
455-612	4,812,815
341-133	4,812,816
341-172	4,812,817
371-030	4,812,818
365-049	4,813,002
346-074	4,813,007

PATENTS

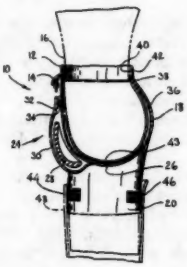
GRANTED MARCH 14, 1989

GENERAL AND MECHANICAL

4,811,427
ATHLETIC GARMENT FOR PROTECTING GENITAL AREA

Paul Regan, 9310 Sheppard Avenue East, P.O. Box 26, Agincourt, Ontario, Canada (M1S 3B4)

Filed Sep. 3, 1987, Ser. No. 92,524
Int. Cl.[4] A41D *13/00*; A41C *1/00*
U.S. Cl. 2—2 **12 Claims**



1. An athletic garment for use in protecting the genital area of a wearer, comprising:

a waistband;

support means associated with the waistband for maintaining the waistband at the waist of the wearer;

an outer pant supported from the waistband, the outer pant having an outer crotch portion, the outer crotch portion having a pocket shaped to receive and releasably retain a genital protector, the pocket being positioned forwardly of the genital area of the wearer when the waistband is maintained at the wearer's waist;

an inner pant located within the outer pant and supported from the waistband, the inner pant having an inner crotch portion and a predetermined rise so selected that the inner crotch portion engages the genital area of the wearer when the waistband is maintained at the waist of the wearer, the inner pant being so supported from the waistband that downward displacement of the genital protector with the outer pant relative to the inner pant causes a loosening of the inner pant from the wearer's body;

the outer pant having a rise greater than the rise of the inner pant such that the genital protector is spaced from and movable relative to the inner crotch portion when the waistband is maintained at the wearer's waist, the difference between the rises of the inner and outer pants being selected such that the genital protector remains in a protective position overlaying the genital area whenever the waistband is maintained at the wearer's waist.

4,811,428
WASHABLE AND DISPOSABLE BIB AND FABRIC FOR MANUFACTURING SAME

Harold L. Waldman, Yardley, Pa.; Charles B. Green, Spanish Fort, Ala.; A. Frederick Fowler, Lewisberg, Pa., and William F. Farr, Atmore, Ala., assignors to International Paper Company, Purchase, N.Y.

Filed Sep. 2, 1987, Ser. No. 92,265
Int. Cl.[4] A41B *13/10*
U.S. Cl. 2—49 R **17 Claims**

1. A disposable bib fabricated of a thermally bonded laminate of vinyl and polyester fiber layers, said bib comprising:

a body portion having interior and outer sides, top and bottom peripheral edges, and side edges, said interior and outer sides respectively being formed by the vinyl and polyester layers of the laminate;

first and second neck fastening members which extend integrally from said top peripheral edge and terminate at overlapping ends;

fastening means for removably and adjustably securing said overlapping ends;

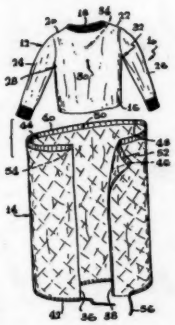
a pocket panel including a boundary edge which overlies and is thermally sealed to said bottom peripheral edge and portions of said side edges, said pocket panel being arranged with the vinyl layer facing said outer side of the body portion, said pocket panel also having an open terminal edge which forms a pocket compartment; and

reinforcing means for sealing said terminal edge of said pocket panel to said side edges of said body portion to provide a durable pocket construction, said reinforcing means including enlarged sealing areas located at opposing ends of said terminal edge at points where said boundary and terminal edges intersect with said side edges of said body portion and extending inwardly from said side edges by a small distance along said terminal edge, whereby the sealing of said opposing ends of said terminal edge is reinforced to a greater extent at points of greater stress between said body portion and said pocket panel.

4,811,429
UNITARY SLEEPWEAR

Barbara Perez, 15069 Oro Grande St., Sylmar, Calif. 91342

Filed Oct. 26, 1987, Ser. No. 112,372
Int. Cl.[4] A41D *10/00*
U.S. Cl. 2—83 **11 Claims**



1. Unitary sleepwear comprising:

an upper night garment and a lower blanket, said night garment and blanket being detachably attachable together;

said night garment having a torso for embracing the upper body of the wear, and having shoulders on the upper part

of said torso of said garment so as to engage over the shoulders of the wearer;

fastener parts attached to said upper night garment;

said blanket of said sleepwear being formed of a flexible cloth material and being sufficiently wide to fully wrap around said torso of said night garment, said night garment having a cooperative fastener parts thereon corresponding to said fastener parts on said blanket so that said blanket may be wrapped around said upper night garment to leave an open bottom to said sleepwear and said blanket is detachably attached to said upper night garment to cover the lower part of the wearer's body.

4,811,430

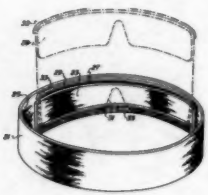
EYE SHIELD AND HEADBAND COMBINATION

Joseph Janusz, 7204 Jacaranda Ave., Miami Lake, Fla. 33014

Filed Dec. 10, 1987, Ser. No. 131,396

Int. Cl.[4] A61F *9/02*

U.S. Cl. 2—452 **6 Claims**



1. In combination, a frameless optical eye shield having an upper shield edge and a headband having an upper headband edge and a lower headband edge, said eye shield comprising a transparent planar sheet having an outer eye shield surface and one of a pair of loop-and-pile fasteners attached along said upper shield edge of said outer eye shield surface, and said headband comprising an annular cloth band having an inner headband surface, the other of a pair of loop-and-pile fasteners attached along said lower headband edge of said inner headband surface, and a pocket attached to said inner headband surface, said pocket having an open upper edge and being adapted to house said eye shield.

4,811,431

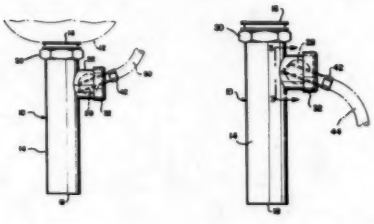
UNIVERSAL TAIL PIECE FOR INSTALLATION IN A WATER WASTE LINE

Robert G. Kraverath, 1311 SW. 83rd Ave., North Lauderdale, Fla. 33068

Filed May 30, 1986, Ser. No. 868,435

Int. Cl.[4] E03C *1/00*

U.S. Cl. 4—191 **12 Claims**



1. A universal tail piece for insertion in a waste pipe of a water drainage system readily adjustable for multiple uses including channeling a portion of the waste water from a primary source to a floor drain trap for priming the same and for draining waste water from a secondary source through the waste pipe along with the waste water from the primary source being drained, comprising

(a) a main tubular portion adapted to be connected to a waste pipe in a substantially vertical position, and including an upper inlet having means for connecting to a waste pipe, a bottom outlet having means for connecting to a floor drain trap, and a main conduit coextensive with the length of the main tubular portion through which the waste water passes;

(b) a tubular boss operatively connected to said main tubular portion;

(c) a secondary conduit disposed within said tubular boss;

(d) said secondary conduit having first and second ends, said first end being in communication with said main conduit, and

(e) means for selectively adjusting said secondary conduit between first and second operating locations;

(f) said first end of said secondary conduit extending inwardly only a portion of said main conduit, and directed toward said upper inlet when in the first operating location, for channeling only a portion of the waste water from the primary source to a floor drain trap for priming the same;

(g) said first end of said secondary conduit, when in said second operating location, being directed toward said bottom outlet, and operable for channeling waste water from a secondary source through the waste pipe along with the waste water from the primary source being drained;

(h) said second end of said secondary conduit, when said secondary conduit is in said first operating location, assuming a position in spaced relation to the position said second end assumes when said secondary conduit is in said second operating location.

4,811,432

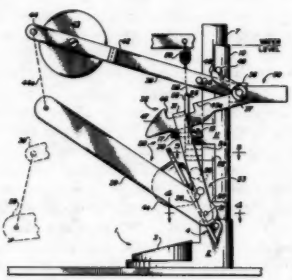
FLUSH TANK WATER SAVER

John L. Harris, 470 Palm Island, NE., Clearwater, Fla. 34630

Filed Jun. 29, 1987, Ser. No. 67,494

Int. Cl.[4] E03D *1/14*

U.S. Cl. 4—325 **19 Claims**



1. A water save control for a toilet flush tank having an outlet fitting, an integral float type flapper valve for closing the outlet of said fitting, pivots supported by the outlet fitting supporting the flapper valve and an externally operated flush lever connected to the flapper valve for opening the flapper valve on upward movement of the flush lever to flushing position, the combination of, pivot means supported by the outlet fitting adjacent the pivots for the flapper valve, lever means carried by said pivot means, said lever means having a first portion extending upwardly to the flapper valve when open and arranged to engage the back of the flapper valve to push same to closed position when moved in one direction said

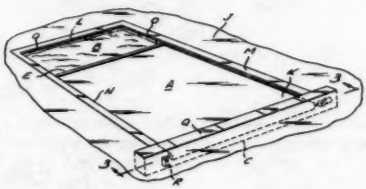
lever means also including an elongated portion extending from its pivot means at an angle to the first portion and beside the flapper valve a distance greater than that from the pivot means to the flapper valve engagement providing a point having mechanical advantage, and float mens engaging said point, said float mens being constructed and arranged to cause movement of the lever means in said one direction when the float means lowers with water level.

4,811,433

POOL COVER EXTENDING AND RETRACTING DEVICE

MacDonald Scott H., 2736 Ingelwood Blvd., and William E. MacDonald, 3455 Stoner Ave., both of Los Angeles, Calif. 90066

Division of Ser. No. 846,127, Mar. 31, 1986, Pat. No. 4,686,717, which is a continuation of Ser. No. 615,934, May 31, 1984, abandoned. This application Dec. 11, 1986, Ser. No. 940,391
Int. Cl.[4] E04H *3/19*
U.S. Cl. 4—502 **4 Claims**



1. A device for enabling a cover to be extended over a pool from retracted pool-uncovering position, for covering the pool, and for enabling the cover to be retracted from extended pool-covering position for uncovering the pool, as desired by the user, in which the cover including opposed sides and first and second opposed ends, comprising:

(a) means for covering the pool, which are rotatable and translatable so as to extend the cover from its retracted pool-uncovering position;

(b) means for uncovering the pool, which are rotatable so as to retract the cover from its extended pool-covering position;

(c) means for rotatably driving the pool covering means and the pool uncovering means, comprising a motor including a drive shaft extending therefrom; and

(d) means for coupling and uncoupling the cover driving means and the pool covering means or the pool uncovering means, which are are rotatable, adapted upon coupling with the pool uncovering means to enable the cover to be retraced from its pool-covering position for uncovering the pool, and upon coupling with the pool covering means to enable the cover to be extended from its pool-uncovering position for covering the pool;

(e) in which the pool covering means include a reel including adjacent reel sections, rotatably positioned proximate the free end of the drive shaft, and adapted to rotate directly with the drive shaft upon disconnection of the cover coupling and uncoupling means from the cover retracting mean, such that the drive shaft is not coupled with the cover retracting means, and upon connection of the cover coupling and uncoupling means to the cover driving means, such that the drive shaft is coupled with the cover extending means, for extending the cover, and means for connecting the reel to the second end of the cover, including first ends and second ends, comprising a pair of cables, each of which includes first and second opposed ends, in which the first ends of the cables are secured to the adjacent reel sections for winding and unwinding thereon, and each cable is adapted to extend from one of the adjacent reel sections along one of the opposed sides of the pool to the first end of the cover comprising the end opposite the end from which the cover is unwound and wound, and in which the first ends of the cover connecting means are secured to the adjacent reel sections, and the second ends of the cover connecting means are secured to the opposed sides of the second end of the cover for unwinding thereof; and

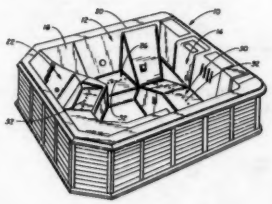
(f) means for enabling adjustment of the diameter of wrapping of each winding of each cable about each reel section.

4,811,434

SPA WITH AN IMPROVED AIR CHANNEL AND METHOD FOR CONSTRUCTING SAME

Donald D. Satterfield, Oklahoma City, Okla., assignor to Kimstock, Inc., Santa Ana, Calif.

Filed Jun. 5, 1987, Ser. No. 58,522
Int. Cl.[4] A61H *33/02*
U.S. Cl. 4—543 **5 Claims**



1. A method for constructing an air channel comprising a tube having opposite ends and a tube opening for a spa having a base with an upper surface and a lower surface, the method comprising the steps of:

forming initial base air holes through the base at predetermined positions in the base with each base air hole intersecting the upper and the lower surfaces of the base;

disposing an adhesive generally over the lower surface of the base about each of the initial base air holes;

disposing the tube, on the lower surface of the base extending generally over each of the initial base air holes with the adhesive being disposed generally between the tube and the lower surface of the base; and

forming a base air hole through each of the initial base air holes, each base air hole having a diameter slightly larger than the diameter of the initial base air holes, and forming tube air holes in the tube, each of the tube air holes being aligned with one of the base air holes, the adhesive connecting the tube to the lower surface of the base and forming a seal generally about each of the base air holes and aligned tube air holes and generally between the lower surface of the base and the tube.

4,811,435

HOSPITAL BED WITH PIVOTING HEADBOARD

L. Dale Foster, Brookville, and Virgil J. Niese, Batesville, both of Ind., assignors to Hill-Rom Company, Inc., Batesville, Ind.

Filed Jan. 15, 1988, Ser. No. 144,188
Int. Cl.[4] A47C *21/00*
U.S. Cl. 5—60 **9 Claims**

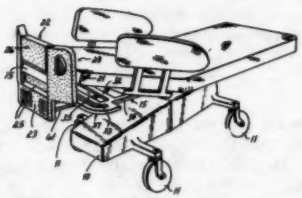
1. An elongated hospital bed comprising:

an elongated frame having an end for a work center,

a work center dimensioned to extend substantially across the end of said frame,

means pivotally mounting said work center to said end of said frame, including an arm pivotally connected to a central interior portion of said frame and having a length extending from said connection to beyond the periphery of said frame adjacent said end allowing horizontal swinging motions of said work center across the end and both

sides of said bed, whereby said work center can function as a headboard or footboard when at the end of said bed



and can be swung to either side of said bed for the convenience of nursing procedures.

4,811,436

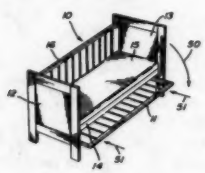
CHILD CRIB WITH DISPLACEABLE AND STORABLE SIDE GATE

Leo Schwartz, Montreal, Canada, assignor to Dorel Industries Inc., Montreal, Canada

Filed Jan. 4, 1988, Ser. No. 140,669

Int. Cl.[4] A47D 7/00

U.S. Cl. 5—93 R **17 Claims**



1. A child crib comprising a head and a foot frame, a mattress supported elevated between said frames, said frames each having opposed vertical side edges, a gate secured to one side of said mattress between a common one of said vertical side edges of said head and foot frames and extending above said mattress, the other common ones of said vertical side edges each having a first straight elongated guide channel means section extending in a predetermined length thereof and communicating at a lower end thereof with a further guide channel means section extending under said mattress, and a displaceable gate having engaging means in opposed side edges thereof for guided engagement with said elongated guide channel means to displace said displaceable gate from a position of use between the said other common ones of said vertical side edges of said frames to a storage position under said mattress, said engaging means of said gate having at least two spaced apart guide members for sliding engagement with said guide channel means, at least one of said guide members having a lock means to secure said displaceable gate in said position of use.

4,811,437

FOLDABLE PLAYYARD

James M. Dillner, Lancaster, and Nathanael Saint, Morgantown, both of Pa., assignors to Graco Metal Products, Inc., Elverson, Pa.

Filed Jun. 26, 1987, Ser. No. 67,741

Int. Cl.[4] A47D 7/00

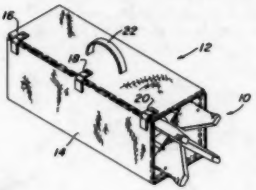
U.S. Cl. 5—99 B **26 Claims**

1. Foldable playyard, comprising:

a unitary central hub member,

a lower frame assembly comprising corner leg connecting members and hub legs each pivotably coupled at one end portion thereof to said hub member and pivotably coupled at an opposite end portion thereof to one of said lower frame assembly corner leg connecting members such that said hub legs are collapsible by pivoting said hub legs from a substantially co-planar spread configuration wherein said hub legs diverge radially outwardly from said hub member to a compact non-coplanar configuration wherein said hub legs are substantially parallel,

an upper frame assembly comprising corner rail connecting members and side rail means each comprising a pair of side rails and a medial rail connecting member disposed therebetween, each of said rails being pivotably coupled at one end portion thereof to one of said upper frame assembly corner rail connecting members and pivotably coupled at an opposite end portion thereof to said medial rail connecting member such that said pair of rails is collapsible by



pivoting said rails from a substantially in-line configuration to a substantially V-shaped configuration, and

corner legs interconnecting said upper and lower frame assemblies, each fixedly coupled at one end portion thereof to one of said lower frame assembly corner leg connecting members and fixedly coupled at an opposite end portion thereof to one of said upper frame assembly corner rail connecting members such that said corner legs are collapsible radially inwardly towards said hub member from a substantially parallel configuration wherein said corner legs are spread apart by said hub legs and side rail means to a substantially parallel compact configuration wherein said corner legs are drawn together by said hub legs and side rails means.

4,811,438

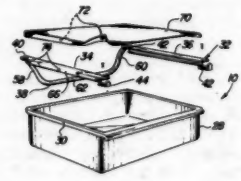
STORAGE UNIT FOR BED ASSEMBLY

Danny Simpson, Seymour, Ind., assignor to Lear Siegler Seymour Corporation, Seymour, Ind.

Filed Mar. 28, 1988, Ser. No. 172,777

Int. Cl.[4] A47C 19/22

U.S. Cl. 5—308 **20 Claims**



1. A bed frame assembly (11) comprising: a plurality of rails (14,16) connected together to form a substantially rectangular frame (12); leg means (22) for supporting said rails (14,16) above a floor (24); at least one drawer (28); drawer support means (32) for supporting said drawer (28) from below said frame (12), said drawer support means (32) being substantially C-shaped when viewed in plan view and having two spaced parallel portions (34,36) and an intermediate portion (38) interconnecting said parallel portions (34,36), said parallel portions (34,36) defining a plane; connecting means for connecting said parallel portions to one of said rails; and weight transfer means for transferring weight applied to said drawer (26) directly

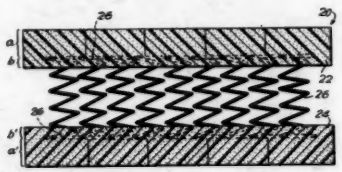
from said drawer support means (36) to the floor (24), characterized by said weight transfer means including an integral portion of said drawer support means (32) curving below said plane, with at least a portion of said integral portion being in contact with the floor.

4,811,439

METHOD OF MANUFACTURING FOAMED INNERSPRING UNIT AND PRODUCT

Edmond Siegel, 26 Warren Pl., Montclair, N.J. 07042, and Nolan D. Gamble, 3417 Winfin Way, Carmichael, Calif. 95608

Filed Aug. 20, 1986, Ser. No. 898,294
Int. Cl.[4] A47C *27/15, 27/20*; B29C *67/22, 39/10*
U.S. Cl. 5—475 **20 Claims**



1. A product prepared by a process comprising:
spraying a foamable, sprayable reaction mixture that will provide a flexible foam having a density of at least 2.0 lbs/ft^3 using diphenylmethane diisocyanate and at least one polyol into a tray by relatively displacing at least one nozzle and the tray to form a layer of the desired thickness in the tray;
positioning an innerspring unit in the foamable reaction mixture in spaced relation to the walls of the tray; and
allowing the foamable reaction mixture to rise to form a foam that is at least partially adhered to one side of the innerspring unit so as to provide a foamed innerspring unit.

4,811,440

COMBINATION HOOD SUPPORT, JACK CRANK, LUG WRENCH AND WHEEL COVER REMOVAL APPARATUS

Robert S. Scott, 3043 W. Clinton St., Phoenix, Ariz. 85029

Filed Jun. 13, 1988, Ser. No. 205,476
Int. Cl.[4] B25F *1/00*
U.S. Cl. 7—100 **16 Claims**

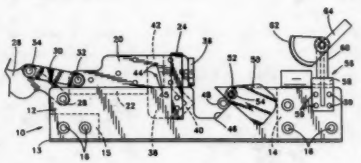
1. Tool apparatus for a vehicle having a hood, wheels secured to the vehicle by lug nuts, and a jack for raising the vehicle, comprising, in combination:
a base member having a first end;
a first arm connected to the base member and extending substantially at a right angle to the base member;
a blade end on the first arm defining a prying tool;
an extension arm having an outer end;
means for connecting the extension arm to the first arm at the blade end;
support means adjacent to the outer end of the extension arm for supporting the vehicle hood;
jack connecting means at the outer end of the extension arm for securing the extension arm, the first arm, and the base member to the jack for cranking the jack; and
lug wrench means disposed on the base member comprising a lug wrench for the vehicle lug nuts when the base member and the first arm is separated from the extension arm and comprising a crank handle when the extension arm is secured to the first arm and the outer end of the extension arm is connected to the jack.

4,811,441

TOOL FOR TRIMMING HOSE AND INSERTING FITTING

Richard E. Potesta, Chesterland, Ohio, assignor to Stride Tool Inc., a New York Corporation, Washington, D.C.

Filed Jun. 10, 1988, Ser. No. 204,745
Int. Cl.[4] B26B *11/00*
U.S. Cl. 7—158 **11 Claims**



1. A tool for trimming a hose and assembling a fitting in said hose comprising:
a base member,
a cutting blade mounted for movement on a path of travel on said base member between a retracted position and an actuated position,
means to support a hose to be but on the base member on said path of travel in a configuration with the axis of the hose transverse to said path of travel,
a fitting insertion die mounted on said base member and reciprocally movable on a path between a retracted position and an actuated position,
means carried by said base to secure a hose with its axis extending substantially along the path of travel of said fitting insertion die and in alignment with said die;
and handle means operatively associated with said base member and said cutting blade and said fitting insertion die to move both said fitting insertion die and said cutting blade between their respective actuated and retracted positions.

4,811,442

SWEEPING APPARATUS

Ronald E. Barker, 855 E. Skyline, Globe, Ariz. 85501

Filed Mar. 21, 1988, Ser. No. 170,845
Int. Cl.[4] E01H *1/05*
U.S. Cl. 15—82 **4 Claims**

1. A sweeping machine including
(a) a frame;
(b) a plurality of ground engaging wheels mounted on said frame;
(c) motive power means mounted on said frame for turning at least one of said wheels to propel said sweeping machine forwardly over the ground;
(d) a support assembly spaced apart from and forward of said frame;
(e) a cylindrical brush having a longitudinal axis, first and second ends, and mounted on said support assembly for rotation about said longitudinal axis, said support assembly

extending from said first and second ends upwardly to an elevation above said brush;

(f) a sloped load bearing linkage framework interconnecting said support assembly and said frame, said linkage framework being attached to said support assembly at points elevated above said brush and including

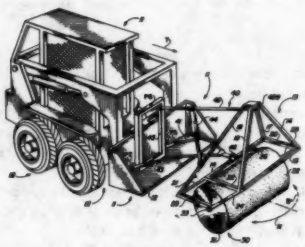
(i) a first elongate linkage member extending from said frame upwardly to said support assembly, said first linkage member having a first end pivotally attached to said frame and having a second end pivotally attached to said support assembly, said second end being above said cylindrical brush,

(ii) a second elongate linkage member extending from said frame upwardly to said support assembly, said second linkage member having a first end pivotally attached to said frame and having a second end pivotally attached to said support assembly;

(g) motor means for rotating said brush, said motor means being carried on at least one of said frame, support assembly and linkage framework;

said first ends of said first and second elongate linkage members being attached to said frame at points having differing elevations;

said second ends of said first and second elongate linkage members being attached to said support assembly at points having differing elevations;



said linkage framework receiving rearward and upward forces generated by said brush during rotation thereof against the ground;

said slope of said first and second elongate linkage members decreasing as said brush wears and the diameter of said brush decreases;

rearward force generated by said brush during rotation thereof producing an upward force acting on said sloped linkage members and opposing the force generated by gravity acting on said brush;

said brush upwardly moving in a direction away from the ground when said cylindrical brush begins to rotate from a stationary position on the ground; and

said brush being forced against the ground

when said machine and brush are stationary, solely by the force of gravity acting on said brush, linkage framework,

support assembly, and the portion of said motor means carried on said support assembly and linkage framework, and

when said machine is stationary and said brush is rotating, by the force of gravity acting on said brush, linkage framework, support assembly, and on the portion of said motor means carried on said support assembly and linkage framework and by downward forces generated by interaction of the rotating brush and the ground.

4,811,443

APPARATUS FOR WASHING OPPOSITE SURFACES OF A SUBSTRATE

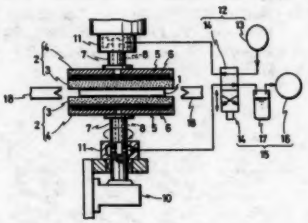
Hisao Nishizawa, Shiga, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Nov. 17, 1987, Ser. No. 121,607

Claims priority, application Japan, Nov. 28, 1986, 61-285395

Int. Cl.[4] B08B 0/1; G03F 0/1

U.S. Cl. 15—97.1 **12 Claims**



1. A washing apparatus for substrates, comprising:

a first disk, and a second disk juxtaposed to the first disk, each of said disks having a respective, generally flat, first surface, the first surfaces of the disks facing one another and effective for accommodating a substrate to be washed therebetween;

means for rotating at least one of the disks for producing relative rotation between the first surfaces of the disks; and

means for supplying a cleaning liquid to the first surface of the first disk while holding the substrate at the second disk and thereafter supplying a cleaning liquid to the first surface of the second disk while holding the substrate at the first disk.

4,811,444

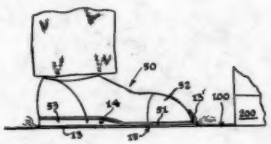
DOUBLE-SIDED ADHESIVE CLEANING APPARATUS

Charles R. Hamblin, 6021 Flintridge Dr., Colorado Springs, Colo. 80918

Filed Jun. 14, 1988, Ser. No. 206,395

Int. Cl.[4] A47L 25/00

U.S. Cl. 15—104 A **4 Claims**



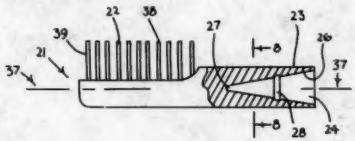
1. A double-sided adhesive cleaning apparatus to be worn on a shoe having a sole and toe portion for picking up debris from a floor surface; wherein, the double-sided adhesive cleaning apparatus comprises:

an elongated adhesive strip member configured to conform to at least a portion of the sole of a user's shoe; wherein, the elongated adhesive strip member includes upper and lower adhesive coated surfaces.

4,811,445
ORAL HYGIENE SYSTEM

Daniel P. Lagieski, 1664 Bollum La., Long Lake, Minn. 55356, and Todd B. Thompson, 4280 Jefferson St., Excelsior, Minn. 55331

Filed Jan. 25, 1988, Ser. No. 147,370
Int. Cl.[4] A46B 9/04
U.S. Cl. 15—104.94 15 Claims



1. An oral hygiene system comprising a disposable head, an aseptic container for storing the head and a handle for penetrating said container and engaging said head,

a. Said disposable head comprising a body portion having an oral hygiene applicator and an end portion having a socket, said socket having a generally annular groove,

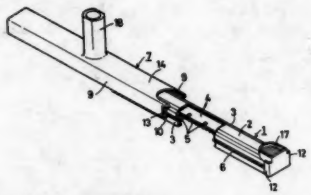
b. Said aseptic container enclosing said head and with the head positioned within said container with said applicator near a first end of said container and the socket positioned near a receiving end, said container having a scored cover over said receiving end for aseptically sealing said head in said container, and

c. Said handle comprising a free end for grasping by a user, and an operating end having a pointed male extension for penetrating said scored cover and engaging said socket, said pointed male extension having a generally annular projection for engaging said annular groove to lock said handle to said head in a snap-fit arrangement.

4,811,446
MOP HOLDER

Koji Tsukamoto, Osaka, Japan, assignor to Yamazaki Corporation, Osaka, Japan

Filed Oct. 13, 1987, Ser. No. 107,452
Int. Cl.[4] A47L 13/24, 13/258
U.S. Cl. 15—147 R 7 Claims



7. A mop holder comprising:

a mop gripper being of a substantially inverted U-shaped section and having a main plate and a pair of side plates integral with said main plate, said side plates having stoppers on the inner surface thereof for engaging a mop gripped between said side plates, said mop gripper having a pair of longitudinal guide ridges on its outer surface, and a first coupling member on said mop gripper at one end thereof for engaging a first end of a retainer for coupling said mop gripper with a retainer;

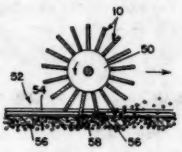
a retainer being of a substantially inverted U-shaped section and having a handle holder and a pair of side plates, said pair of side plates having a pair of longitudinal flanges at lower ends thereof, and a second coupling member for coupling said side plates of said retainer together at a second end of said retainer; and

said mop gripper being received in said retainer with said guide ridges on said mop gripper rested on said longitudinal flanges on said retainer for preventing said mop griper from falling off said retainer.

4,811,447
TRACK BROOM BRISTLE

Richard W. Everson, 408 Windsor Dr., Salisbury, N.C. 28144

Filed Jul. 28, 1986, Ser. No. 890,241
Int. Cl.[4] A46B 13/02, 7/10
U.S. Cl. 15—159 A 7 Claims



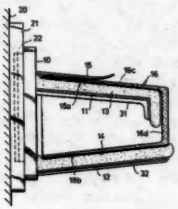
1. A sweeper bristle element comprising a solid elastomeric core having a longitudinal axis and;

at least one layer of rubber coated fabric with cords therein encircling said core, said cords of said fabric extending parallel to said longitudinal axis of said core.

4,811,448
CLEANING DEVICE FOR A CONTAINER

Mikio Yagi, No. 220, Hosoe, Haibara-cho, Haibara-gun, Shizuoka-Ken, Japan

Filed Oct. 8, 1987, Ser. No. 106,579
Claims priority, application Japan, Oct. 13, 1986, 61-242316
Int. Cl.[4] A47L 17/08
U.S. Cl. 15—211 4 Claims



1. A cleaning device for cleaning a container such as a glass mounted thereon comprising:

a base;

first and second pillars standing on the base in a generally vertical direction to the base and respectively extending along contours of inner and outer surfaces of the container to be cleaned;

first and second elastically deformable soft sponge cleaners respectively carried by the first and second pillars for cleaning the inner surface and the outer surface of the container, said first sponge cleaner being carried by the first pillar along a surface facing away from the second pillar and said second sponge cleaner being carried on the second pillar along a surface facing the first pillar;

a third pillar standing on the base in a generally vertical direction to the base in vicinity of the first sponge cleaner carried by the first pillar and extending along the first cleaning body at a side far from the second pillar with reference to the first pillar, said third having a tip portion curving away from the first sponge cleaner; and wherein

said first, second and third pillars are formed as an integral body together with said base from a resilient plastic material, and

said first pillar supporting the inner surface of a first wall portion of the container mounted on the cleaning device for cleaning by said first sponge cleaner, said second pillar supporting the outer surface of a second wall portion

which diametrically opposes said first wall portion of the container mounted on the cleaning device for cleaning by said second sponge cleaner, said third pillar engages the outer surface of said first wall portion of the container mounted on the cleaning device to urge the container in the direction of said first and second sponge cleaners, the cleaning device cleaning the inner and outer surfaces of the container by said first and second sponge cleaners as the container mounted on the cleaning device is rotated.

4,811,449

CLEANER

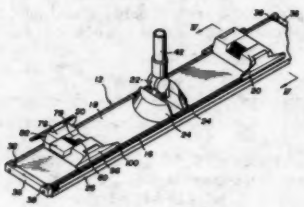
Kiyoshi Kobayashi, Chiba, Japan, assignor to Kabushiki Kaisha Hoky (aka Hoky Corp.), Chiba, Japan

Filed Oct. 13, 1987, Ser. No. 107,640

Claims priority, application Japan, Oct. 13, 1986, 61-156396[U]

Int. Cl.[4] A47L *13/256, 13/29*

U.S. Cl. 15—231 **3 Claims**



1. A cleaner comprising:

a main body having an upper surface, a bottom surface and opposite side surfaces extending between said upper and said bottom surfaces;

a pile comprising short tufts extending from the opposite side surfaces of said main body;

fasteners disposed on the upper surface of said main body and releasably engageable with the side surfaces of said main body; and

a cloth having an area slightly larger than the area of the bottom surface of said main body,

said cloth extending over the bottom surface of said main body, said cloth extending over the opposite side surfaces of said main body and pierced by said pile thereat, and said cloth engaged by said fasteners at the opposite side surfaces of said main body so as to be releasably retained thereby against the opposite side surfaces of said main body.

4,811,450

VACUUM CLEANER WITH IMPROVED AUXILIARY CLEANING

Stephen W. Steadings, Seneca, S.C., assignor to Ryobi Motor Products Corp., Pickens, S.C.

Filed Aug. 27, 1987, Ser. No. 89,799

Int. Cl.[4] A47L *5/32, 9/00*

U.S. Cl. 15—337 **22 Claims**

1. A vacuum cleaner adapted for use with auxiliary cleaning attachments, said vacuum cleaner comprising:

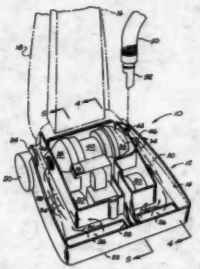
a chassis having a main suction intake port area;

suction motor means supported on said chassis;

first and second and means, commonly driven by said suction motor means, for establishing respective suction air flows within said chassis;

first and second suction channel means, defined within said chassis, for respectively guiding said suction air flows between said respective fan means and said main suction intake port area so that dust and dirt adjacent said main suction intake port area may be suctioned into said chassis directed towards said fan means along the respective suction channel means;

auxiliary cleaning means for selectively alternatively directing suction air flow within said flow suction channel means to a desired alternate suction area outside said chassis for suctioning dust and dirt from adjacent such alternate suction area instead of from adjacent said main suction intake port area; and



air flow blocking means for causing interruption of suction air flow within said second suction channel means so as to remove from said second fan means the work load of moving air flow within said second suction channel means, which thereby relieves part of the commonly-driven load of said suction motor means resulting in relatively increased operational speed for said first fan means and correspondingly increased suction air flow in said first suction channel means and at said alternate suction area.

4,811,451

WINDSHIELD WIPER INSTALLATION

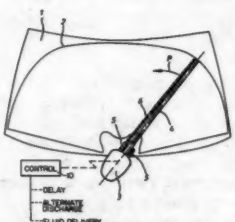
Traugott Roller, Sulz-Wildberg, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Oct. 7, 1987, Ser. No. 105,286

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1986, 3634407

Int. Cl.[4] B60S *1/46*

U.S. Cl. 15—250.04 **8 Claims**



1. A windshield wiper installation, comprising a windshield washing system including at least one nozzle means, wiper arm means including wiper blade means, the nozzle means partaking in the pivot movements of the wiper arm means at a base end thereof, and washing liquid being sprayed from the nozzle means in a focused jet from the base of the wiper arm means directly along the side of the wiper blade means toward the free end thereof on the side of the wiper blade means disposed in front of the respective wiping direction.

4,811,452

AUXILIARY ATTACHMENT ADAPTOR AND VACUUM CLEANER FOR USE THEREWITH

William R. Sumerau, Easley, S.C., assignor to Ryobi Motor Products Corp., Pickens, S.C.

Filed Jan. 25, 1988, Ser. No. 147,426
Int. Cl.[4] A47L 5/32
U.S. Cl. 15—337 21 Claims

1. A vacuum cleaner adapted for use with auxiliary cleaning attachments, comprising a main chassis having a main suction nozzle, a dirt collecting bag, a vacuum channel for interconnecting said main suction nozzle with said dirt collecting bag, suction motor means for providing suction force in said vacuum channel and directed toward said dirt collecting bag, an auxiliary suction port adapted for receipt and securement therein of an auxiliary cleaning attachment, and diverter means adjacent said vacuum channel and operatively associated with said auxiliary suction port for automatically diverting suction force provided in said vacuum channel from said main suction nozzle to said auxiliary suction port upon receipt and securement of an auxiliary cleaning attachment therein, said diverter means comprising a pivoting door received within said main chassis and mounted for selected pivoting thereof into said vacuum channel, said pivoting door having a relatively rigid finger member projecting therefrom for selected pivoting actuation of said door, said auxiliary suction port including an opening of predetermined circumferential configuration formed through said main chassis for receiving, guiding, and permitting subsequent rotation of, an auxiliary cleaning attachment therein, with such attachment being guided so as to ensure actuation of said diverter means therewith upon such subsequent rotation, whereby said vacuum cleaner is adapted to automatically apply suction force to an auxiliary cleaning attachment inserted therein instead of said main vacuum nozzle thereof for auxiliary cleaning with such attachment.

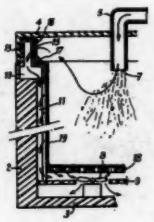
4,811,453

VACUUM CLEANER WITH AN AIRTIGHT FLEXIBLE BAG

Jacques Lubraniecki, 58 avenue de Lattre de Tassigny, 54000 Nancy, France

Filed Jun. 21, 1988, Ser. No. 209,566
Claims priority, application France, Jun. 25, 1987, 87 08945
Int. Cl.[4] A47L 9/14
U.S. Cl. 15—347 5 Claims

1. A vacuum cleaner comprising an airtight enclosure having a suction orifice, an air-permeable support disposed inside the enclosure for receiving an airtight bag, said bag having an opening facing the suction orifice, a suction device, suction ducts each having a first end opening out in the vicinity of the suction orifice on the inside of the bag and having a second end opening out in the vicinity of the suction device, and an exhaust orifice connected to the suction device, wherein the suction ducts extend around the bag support and are in communication with the outside of the bag in an intermediate zone between their first and second ends.

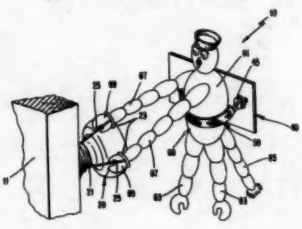


4,811,454

DOOR HOLDER

Tina Crook, and Geraldine Crook, both of Rte. 1, Box 83B, Richmond Hill, Ga. 31324

Filed Mar. 4, 1987, Ser. No. 21,708
Int. Cl.[4] E05C 3/04
U.S. Cl. 16—82 8 Claims



1. An improved door holder comprising:
(a) a ring member connectable to a door knob attached to a door;
(b) a bracket member attached to a wall adjacent to said door knob in an open position of said door; and
(c) interconnection means for releasable interconnection between said ring member and bracket member to releasably hold said door in said open position;
(d) said ring member including a flexible ring stretchable over said door knob and at least one elongated fastener connected to said ring at one end thereof and releasably connectable to said interconnection means at another end thereof.

4,811,455

WINDOW SPRING ANCHOR

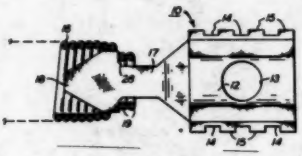
Wilford G. Ost, and Norman R. Westfall, both of Rochester, N.Y., assignors to Caldwell Manufacturing Company, Rochester, N.Y.

Filed Apr. 8, 1988, Ser. No. 179,309
Int. Cl.[4] E05F 1/00
U.S. Cl. 16—197 9 Claims

6. A system of anchoring a window balance spring within a channel, said system comprising:
a. a window balance spring and an anchor plate secured to an end region of said window balance spring;
b. said anchor plate having opposed projections at opposite edges of an initially arched region that allows said projec-

tions to be positioned between side walls of said channel; and

c. said arched region of said anchor plate being flattened against a bottom of said channel to spread said opposed



projections apart so that said projections extend into and deform said side walls of said channel for interlocking said anchor plate with said channel to resist the force of said balance spring.

4,811,456

APPARATUS FOR SEPARATING BONE AND FLESH OF THE LEGS OF POULTRY OR PART THEREOF

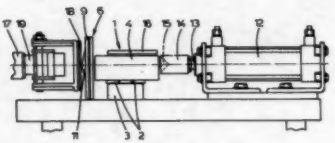
Johannes v. d. Heuvel, Noordwijkerhout, Netherlands, assignor to Machinefabriek MEYN B.V., Ae Oostzaan, Netherlands

Filed Jan. 12, 1988, Ser. No. 143,562

Claims priority, application Netherlands, Jan. 28, 1987, 8700213

Int. Cl.[4] A22C *17/04, 21/00*

U.S. Cl. 17—1 G **17 Claims**



1. Apparatus for separating flesh from the bones of the legs of poultry, such as thighs and drumsticks, comprising:

(a) a moving conveyor which moves in stepwise increments, for conveying said legs in a direction substantially transversely of their longitudinal axis;

(b) a stripper, disposed alongside said conveyor, having a frame supporting an elastic funnel-shaped membrane, which has a rounded opening, having dimensions to permit the leg bones to pass therethrough but which do not permit the flesh of said legs to pass therethrough; and

(c) means for moving individual legs along their longitudinal axes transversely of said conveyor into said stripper, continuing said movement to move said leg bones through the rounded opening in said membrane while stripping the flesh from said bones.

4,811,457

DEBONING MACHINE

Heinrich Lindert, Koelkebecker Str. 62, 4802 Halle, Fed. Rep. of Germany

Filed Feb. 3, 1988, Ser. No. 151,812

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1987, 37038362

Int. Cl.[4] A22C *21/00*

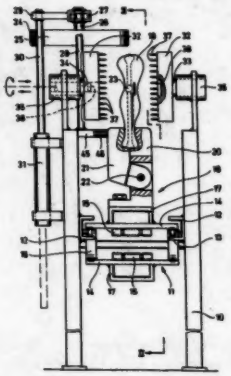
U.S. Cl. 17—11 **19 Claims**

1. A machine for processing objects such as poultry parts, meat pieces or the like, comprising

a machine frame;

endless conveyor means mounted on said frame for displacement;

a plurality of holding means mounted on said conveyor means for displacement therewith and each including a displacement frame and gripping means mounted on said displacement frame and operative for firmly holding one of the objects in each instance; and



means for dissociating bones and/or cartilaginous inclusions from meat tissue of the respective object, including a punch-type annular dissociating device mounted on said machine frame for automatic displacement transversely to the displacement direction of the objects.

4,811,458

PLUCKING DEVICE

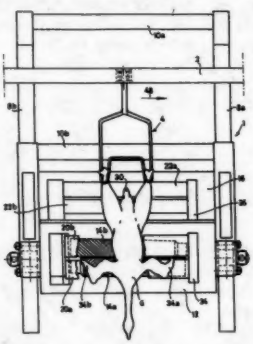
Josephus A. v.d. Nieuwelaar, Gemert, and Petrus C. M. Janssen, Wilbertoord, both of Netherlands, assignors to Stork PMT B.V., Netherlands

Filed Jun. 13, 1988, Ser. No. 206,263

Claims priority, application Netherlands, Jun. 12, 1987, 8701377

Int. Cl.[4] A22C *21/02*

U.S. Cl. 17—11.1 R **9 Claims**



1. Device for the plucking of slaughtered poultry, comprising two elongated, cylindrical, plucking elements with surface irregularities which are positioned at some distance from each other and can be driven rotatingly in mutually opposite directions and which are mounted along a conveyor track for slaughtered poultry which is being transported hanging thereon by the legs, in which at least over a part of the length of both cooperating elements the surface irregularities are

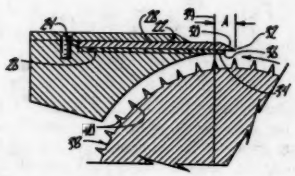
formed by helical toothing cooperating over at least a part of the length of the elements and having such a pitch, that with a suitable chosen rotational speed of the elements, the poultry is driven by the elements in the longitudinal direction of the conveyor track.

4,811,459

BLADE FOR MEAT SKINNING MACHINES

Ray T. Townsend, Des moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Filed May 20, 1988, Ser. No. 196,234
Int. Cl.[4] A22C *17/12*
U.S. Cl. 17—21 15 Claims



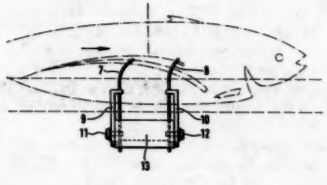
1. A blade means for meat skinning machines, comprising,
an elongated blade means having a rearward edge and an opposite tapered cutting edge portion terminating in a cutting edge and upper and lower surfaces,
said blade means including a heel portion comprising an elongated edge surface terminating in a lower heel line which is parallel to said cutting edge,
the angle between said cutting edge and said heel line being approximately between 20° and 45° relative to a horizontal plane passing through said cutting edge.

4,811,460

IMPROVEMENT IN GUTTING MACHINES FOR FISH

Karl J. Emanuelsen, Hafrsfjord, Norway, assignor to Trio Industrier A/S, Forus, Norway

Filed Dec. 17, 1987, Ser. No. 134,226
Int. Cl.[4] A22C *25/00*
U.S. Cl. 17—51 7 Claims



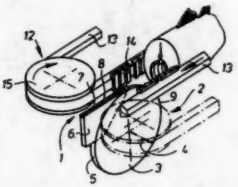
1. A method for gutting and cleaning fish, particularly trout or salmon comprising: guiding the fish in a swimming position sequentially through a series of cleaning operations, and washing the cavity of the fish with water as it is cleaned, cutting the fish belly; removing the fish intestines, cutting the abdominal membrane covering the blood rim, disposing a resilient scraping means in the abdominal cavity of the fish; said resilient scraping means being resilient in the swimming direction of the fish; resiliently scraping the fish abdominal cavity, and removing the blood rim substantially in one continuous piece to avoid contamination of the washing water with the blood.

4,811,461

APPARATUS FOR MECHANICALLY PROCESSING FISH OF THE TRACHURUS SPECIES

Günter Behnk, Reinfeld, and Dieter Niske, Stockelsdorf, both of Fed. Rep. of Germany, assignors to Nordischer Maschinenbau Rud. Badder GmbH & Co. Kg, Lubeck, Fed. Rep. of Germany

Filed Mar. 31, 1988, Ser. No. 175,750
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1987, 3710851
Int. Cl.[4] A22C *25/16*
U.S. Cl. 17—56 4 Claims



1. An apparatus for mechanically processing decapitated fish, which fish have a head end and a tail end defining a swimming direction of said fish, an abdominal cavity extending from said head end towards said tail end ending in an anal region, said fish having been decapitated, abdominally opened and gutted, the apparatus comprising
a. a guideway;
b. conveyor means for conveying said decapitated fish in said swimming direction along said guideway;
c. a tool for opening said abdominal cavity, including two circular knives arranged symmetrically with respect to said guideway, defining cutting edges with an active part with regard to said fish and forming a gap between them;
d. a guide member fixedly arranged between said two circular knives in an area downstream of said active part of said cutting edges;
e. said guide member substantially filling a lateral dimension of said gap;
f. said guide member including an upper edge forming at least a part of said guideway;
g. said guide member including a leading edge directed counter to said fish conveying direction in the region of the culmination point of said cutting edges;
h. said leading edge being sharp;
i. a deflector surface on said guide member contiguous to said leading edge;
j. said deflector surface leading away from said leading edge at an angle to provide an included angle between said upper part and said deflector surface of substantially less than 90 degrees.

4,811,462

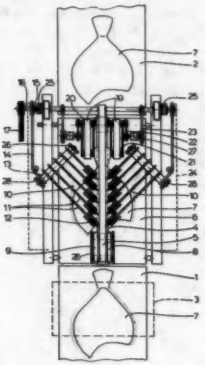
APPARATUS FOR PROCESSING FILLETED FLAT-FISH

Pieter Meyn, Oostzaan, Netherlands, assignor to Meyn Weighing Systems B.V., Ae Oostzaan, Netherlands

Filed Sep. 29, 1987, Ser. No. 102,548
Claims priority, application Netherlands, Dec. 19, 1986, 8603233
Int. Cl.[4] A22C *25/14, 25/17*
U.S. Cl. 17—62 22 Claims

1. Apparatus for removing fat brims from fillets of flatfish, comprising:
(a) flat conveyor means for conveying said fillets along a first planar path, said conveyor means having a width which is less than the width of said fillets; and

(b) rotary brush means disposed alongside said conveyor means, moving in a path transverse to said first path, for



engaging said fat brims and for removing said fat brims from said fillets.

4,811,463

FIBER TUFT FEEDER FOR A TEXTILE PROCESSING MACHINE

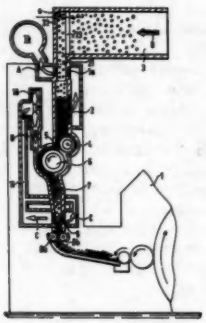
Ferdinand Leifeld, Kempen, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchen-Gladbach, Fed. Rep. of Germany

Filed Sep. 5, 1987, Ser. No. 101,863

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1986, 3633398

Int. Cl.[4] D01G *23/02, 15/40, 9/16*

U.S. Cl. 19—105 **8 Claims**



1. In an apparatus for feeding fiber material to a fiber processing machine; the apparatus including a vertically-oriented fill chute having an open top, a bottom and a generally rectangular cross section of opposite narrow sides and opposite wide sides: fiber charging means including a duct having an open end communicating with the fill chute adjacent the top thereof at one of said wide sides for introducing a fiber material-carrying airstream into the fill chute; air outlet openings provided in the fill chute for allowing passage of air from the fill chute; and discharge means for withdrawing fiber material from said bottom of the fill chute; the improvement wherein said duct has a terminal length portion ending in said outlet opening; said terminal length portion having an at least approximately quadrate cross section; the improvement further comprising means defining a space of impact between said opening and said open top of said fill chute; said opening being at least approximately centered with respect to a horizontal middle of said space of impact.

4,811,464

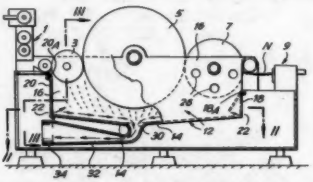
PNEUMATIC ASSEMBLY FOR WASTE REMOVAL

Marcello Giuliani, Via Cellerese No. 33 50013 Campi Bisenzio, Firenze, Italy

Filed Sep. 22, 1987, Ser. No. 99,611

Int. Cl.[4] D01G *15/82*

U.S. Cl. 19—107 **3 Claims**



1. The combination with a carding machine for the pneumatic cleaning and removal of fibrils and various waste products in order to avoid the accumulation thereof in wool or cotton carding machines destined for spinning which comprises:

a carding machine characterized by an arrangement of carding members comprising drum and cylinders,

and a casing disposed below said arrangement of carding members cooperably associated therewith formed of a bottom wall, side walls and end walls which cooperate to form a substantially sealed chamber within said casing below said arrangement of carding members capable of developing a vacuum therein,

each of said end walls being adjustably mounted to provide a slotted opening with said bottom,

the size of each of said slotted openings being adjustably varied according to the size required,

said bottom wall having a transverse opening located substantially centrally of said bottom and extending substantially across said bottom,

said bottom wall converging from each of said end walls towards said transverse opening in a downwardly sloping direction,

said transverse opening communicating with a suction member through which fibrils and waste products are removed.

4,811,465

CLOSURE FOR THE FLUID-TIGHT CLOSING OF BAGS, THIN-WALLED TUBES AND THE LIKE

Jan Folkmar, Zurich, Switzerland, assignor to Ice-Pack Service AG, Zurich, Switzerland

Continuation of Ser. No. 032,338, filed as PCT EP86/00449 on Jul. 29, 1986, published as WO87/01097 on Feb. 26, 1987, abandoned.

This application Jul. 21, 1988, Ser. No. 223,723

Claims priority, application Denmark, Aug. 20, 1985, 3781

Int. Cl.[4] B65D *77/10*

U.S. Cl. 24—30.5 R **6 Claims**

1. A clamp for fluid-tight closing of containers such as bags and thin-walled tubes comprising a female part and male part each comprising a flat piece made from plastic

wherein the female part comprises an elongate channel member being open at its one side and projecting vertically from the associated piece,

wherein the male part comprises an elongate insertion member vertically projecting from its associated piece and adapted to be inserted into the channel member of the female part through the open side of the channel member, the channel member and the insertion member each compris-

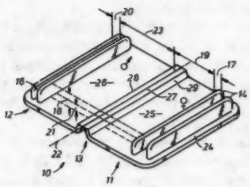
ing wall members projecting from their associated flat piece by a predetermined height,

said female part being provided with hinge carrier means at an edge opposite the channel member,

said male part being provided with hinge carrier means at an edge opposite the insertion member,

said hinge carrier means protruding to the same side as the corresponding channel member on the female part and to the same side as the corresponding insertion member on the male part,

the hinge carrier means thus locating a hinge joint spaced in a perpendicular direction from a plane of the flat piece of the male part and in a perpendicular direction from a plane of the flat piece of the female part at a distance which corresponds substantially to one half of the height of the channel member and of the insertion member,



wherein the internal width of the channel member and the external width of the insertion member are dimensioned to provide means for bringing the insertion member into engagement with the channel member with a part of a container lying in between the two members and with both pieces lying parallel to each other,

the wall members of the channel member of the female part having internal surfaces,

the wall members of the insertion member of the male part having external surfaces,

the internal surfaces of the channel member and the cooperating external surfaces of the insertion member all being substantially parallel when the clamp is in a closed condition.

4,811,466

RELEASABLE PULL CORD ENGAGEMENT DEVICE

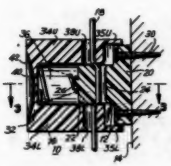
Albert F. Zubli, 88 Cedar Drive, Great Neck, N.Y. 11021

Filed Mar. 23, 1987, Ser. No. 28,967

The portion of the term of this patent subsequent to Sep. 14, 2004, has been disclaimed.

Int. Cl.[4] F16G *11/00*

U.S. Cl. 24—115.G **16 Claims**



1. A releasable pull cord engagement device for venetian blinds or a similar window or door covering comprising:

(A) mounting post means adapted to be attached to a surface near the covering;

(B) said mounting post means comprising a cylindrical pedestal having a given outer diameter;

(C) a transverse hole passing through said cylindrical pedestal having an inner diameter larger than the outer diameter of a pull cord and adapted to have a pull cord readily pass through it;

(D) a stud having a given outer diameter extending from the center of the outer end of said cylindrical pedestal;

(E) slider means having end and side walls encompassing a cylindrical hollow portion with an inner diameter slightly larger than the given outer diameter of said cylindrical pedestal and adapted to encompass and slide over said cylindrical pedestal;

(F) a conical spring having a maximum outer diameter slightly less than the inner diameter of said cylindrical hollow portion and a minimum diameter slightly larger than the outer diameter of said stud, said conical spring having its maximum diameter end abutting the inside of the end wall of said slider means and its minimum diameter end encircling said stud;

(G) an upper hole passing through a portion of said side wall of said slider means and an aligned lower hole passing through an opposite portion of said side wall of said slider means, said upper and lower holes each having an inner diameter which is larger than the outer diameter of the pull cord and, when said upper and lower holes are aligned with the transverse hole of said cylindrical pedestal, a pull cord may be readily passed through said aligned holes;

(H) whereby, when said slider means is pushed against the spring pressure of said conical spring and against said mounting post means, said upper, lower and transverse holes are in alignment and a pull cord will readily pass through said aligned holes, and when said slider means is released, said conical spring will urge said upper and lower holes out of alignment with said transverse hole to engage said pull cord at the junctions of said upper and lower holes with said transverse hole by bending said pull cord at said junctions.

4,811,467

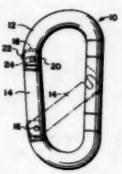
CARABINER HAVING IMPROVED GATE STRUCTURE

Greg E. Lowe, 4172 Piedra Ct., Boulder, Colo. 80301

Filed Jan. 6, 1983, Ser. No. 456,129

Int. Cl.[4] A44B *13/02*

U.S. Cl. 24—241 PS **4 Claims**



1. An improved carabiner comprising:

a C-shaped member having a back wall with an opening defined at least partially therein and end portions defining a gate opening across the open portion thereof and spaced from the back wall opening; and

a gate member pivotally attached at one end to one end portion of the opening defined by the C-shaped member for movement from the gate opening substantially towards the back wall of the C-shaped member, and engaging the other side of the opening defined by the C-shaped member at a latch means structurally connecting the gate member to the C-shaped member, the gate member being narrowed in the plane of the C-shaped member at the portion thereof comprising the latch means and configured to fit within the opening defined in the C-shaped member back wall, whereby the gate member will both open wider as a result of accommodation into the back wall, and the narrow portion thereof will be shielded in the opening to permit smooth movement of ropes over the gate member.

4,811,468

HOOK ELEMENT FOR SURFACE FASTENERS

Yasuo Yamada, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Nov. 25, 1987, Ser. No. 125,177
Claims priority, application Japan, Nov. 26, 1986, 61-180555
Int. Cl.[4] A44B 18/00
U.S. Cl. 24—442 2 Claims

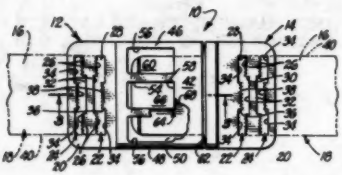
1. A hook element for surface fasteners which is made of a thermoplastic monofilamentary material and which is provided with a coarse surface finish having a multiplicity of alternate minute recesses and ridges distributed over the entire peripheral surface of said hook element.

4,811,469

QUICK RELEASE FASTENERS

Leif Rise, 7748 Westlawn Ave., Los Angeles, Calif. 90045

Filed Jul. 24, 1987, Ser. No. 77,428
Int. Cl.[4] A41F 1/00
U.S. Cl. 24—664 5 Claims



1. A fastener structure including a unitary latch receptacle of a deformable, resilient material which is provided with an open end and an internal latch means accessible through said open end and including a catch member shaped so as to be capable of being inserted into said latch receptacle through said open end, said catch member being provided with a catch means capable of being engaged by said latch means so as to secure said catch member against movement relative to said latch receptacle when said catch member has been inserted into said receptacle in which the improvement comprises:

said latch receptacle has a base which is adapted to be used in attaching said receptacle to a belt, said open end being located on an end of said latch receptacle which is opposite said base,

said receptacle also having a front side, a back side, a top wall and a bottom wall, said front and back sides being opposite one another and extending between said ends of said latch receptacle, said top and bottom walls being opposite one another and extending between said ends of said latch receptacle, said top and bottom walls having unitary walls connecting said front and back sides,

said front and back sides and said top and bottom walls defining an internal cavity within said receptacle, which cavity is in communication with said open end,

one of said sides including latch means, said latch means extending from said one of said sides into the interior of said cavity a sufficient distance so that when said catch member is inserted into said cavity through said open end, said catch means distends said latch receptacle so as to bow said front and back sides outwardly away from one another as said top and bottom walls are moved toward one another as said catch means is inserted through said open end until such time as said latch means is adjacent to said catch means in a position in which the resilience of said receptacle will cause said catch means to move into engagement with said catch means so as to hold said catch means in engagement with said latch means by contact between said catch means,

said receptacle being sufficiently large and resilient and said catch member being sufficiently small to permit the disengagement of said latch means from said catch means so as to release said catch member upon pressure being applied to said top and bottom walls so as to move them towards one another so as to cause said sides to bow outwardly away from one another,

said catch means being incapable of acting on said front and back sides so as to be released from said cavity by being pulled from it after being inserted unless pressure is applied to said walls of said receptacle to cause them to move so that said sides are bowed to release said catch means,

said catch means and said latch means having vertical shoulders which cooperate to hold said catch member in said cavity except when pressure is applied to said sides of said receptacle,

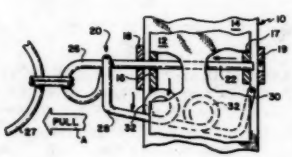
said top and bottom walls being sufficiently curved so as to facilitate said sides bowing when pressure is applied to said top and bottom walls.

4,811,470

SAFETY CLIP WITH CONTROLLED RELEASE FORCE

Peter H. Van Sloun, Hopkins, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 27, 1987, Ser. No. 78,331
Int. Cl.[4] F42C 15/20
U.S. Cl. 24—453 7 Claims



1. In combination:

a safety clip (20);

a movable member (12); and

a fixed member (14);

said movable member and said fixed member including means forming pairs of aligned apertures (16, 18-17, 19), the pairs of means forming aligned apertures being spaced apart a predetermined distance;

said safety clip (20) being made of resilient wire configured to have a substantially straight leg (22), said straight leg (22) extending from an attachment loop (26) to a free locking end (24), said straight leg (22) being inserted through the means forming apertures (16, 18-17, 19), with free locking end (24) extending beyond the means forming apertures (16, 18-17, 19) of movable and fixed members (12,14), a substantially U-shaped back portion (28) extending from attachment loop (26) to a closed loop (30) through which free locking end (24) of straight leg (22) is inserted, said back portion (28) encompassing said means forming pairs of aligned apertures (16, 18-17, 19); and at least one spring element (32) being formed in back portion (28); whereby, safety clip (20) can be removed from the

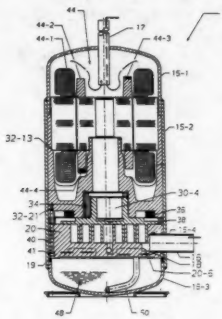
aligned pairs of means forming apertures (16, 18-17, 19) by a predetermined force applied to attachment loop (26) in a direction substantially parallel to the apertures of the means forming apertures (16, 18-17, 19) of fixed member (14) and movable member (12).

4,811,471

METHOD OF ASSEMBLING SCROLL COMPRESSORS

Shahrokh Etemad, E. Syracuse; Donald Yannascoli, Fayetteville, both of N.Y., and Michael Hatzikazakis, Greenville, S.C., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 27, 1987, Ser. No. 125,898
Int. Cl.[4] B23P *15/00*
U.S. Cl. 29—156.4 R 3 Claims



1. A method of assembling a high side hermetic scroll compressor suitable for use in any selected orientation between vertical to within at least 20° of horizontal where the compressor includes a top, lower and middle shell, an oil sump, suction gas delivery means, anti-rotation means, a fixed scroll having a bore, an orbiting scroll having a boss with a bore therein, a bearing head, a motor including a rotor and a stator and a crankshaft having a flange and an eccentric, comprising the steps of:

securing a counterweight into the flange of the crankshaft such that at least a portion of the counterweight is located radially outward of the eccentric of the crankshaft;

with the crankshaft having one end extending through the bearing head and the eccentric received in the bore in the boss of the orbiting scroll, bolting the fixed scroll and bearing head together with a spacer and the orbiting scroll therebetween so as to form a chamber in which the anti-rotation means is operatively connected to the orbiting scroll and with the flange of the crankshaft defining a thrust member between the bearing head and the boss of the orbiting scroll;

fitting the stator of the motor into the bearing head while securing the rotor of the motor onto the end of the crankshaft extending through the bearing head;

inserting the assembly made up of the crankshaft, bearing head, fixed and orbiting scrolls, spacer, anti-rotation means and motor into a middle shell;

inserting a suction tube through the middle shell so as to be in fluid communication with the suction gas delivery means and securing the suction tube in place;

inserting an oil pickup tube having an inlet and an outlet end into a bore in the fixed scroll which defines a portion of the oil distribution path such that the inlet end of the tube will be beneath the oil in the sump when the compressor is in its intended orientation of operation as defined by the location of the suction tube and an axially disposed discharge line;

inserting the lower shell which defines the oil sump into the middle shell until it engages the fixed scroll;

suitably securing the lower shell to the middle shell;

inserting the top shell which includes the axially disposed discharge line into the middle shell until it engages the bearing head; and

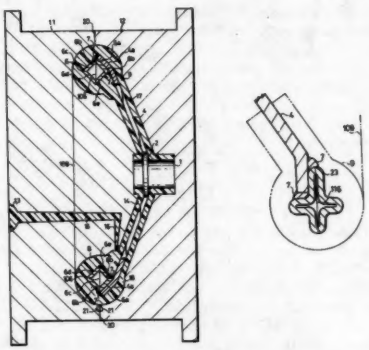
suitably securing the upper shell to the middle shell whereby the assembly is securely held in place by the upper and lower shells and the compressor can be operated in a preselected orientation as determined by the location of the inlet end of the oil pickup tube in the sump.

4,811,472

METHOD OF MAKING A STEERING WHEEL

Teruo Kobayashi, Aichi, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Division of Ser. No. 856,156, Apr. 25, 1986, abandoned. This application Feb. 18, 1987, Ser. No. 17,007
Claims priority, application Japan, Apr. 26, 1985, 60-92093
Int. Cl.[4] B21D *53/26*
U.S. Cl. 29—159 B 11 Claims



1. A method for making a steering wheel, comprising:

(a) providing a steering wheel metal core which includes a ring portion, a boss portion for fitting the steering wheel to a steering shaft, and at least one spoke portion having one end joined to the ring portion and an opposite end joined to the boss portion; the ring portion, in transverse cross-section being a geometric figure having four apices comprising two pairs of circumferentially non-adjacent apices, one of these pairs including a first apex which extends generally radially inwardly with reference to the center of the ring portion and a second apex which extends generally radially outwardly with reference to said center;

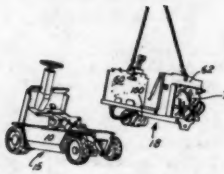
(b) providing an openable-closable mold including two complementary mold parts which, when the mold is closed, define a mold cavity for a steering wheel and, when the mold is opened, part from one another along a parting line plane;

(c) disposing at least said ring portion of said steering wheel metal core in said mold and closing said mold with said ring portion so arranged in said mold cavity that an imaginary plane passing generally radially through said ring portion so as to contain said first and second apices, is substantially aligned with said parting line plane of said mold;

(d) while said ring portion of said steering wheel metal core is so disposed, molding a layer of synthetic resin about said ring portion of said steering wheel metal core by filling said mold cavity about said ring portion with a molding composition of such synthetic resin; and

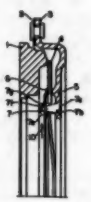
(e) opening said mold along said parting line plane and removing the resulting steering wheel from said mold.

4,811,473
METHOD OF MANUFACTURING ELECTRIC LIFT TRUCKS
David H. Link, 21125 Swafford Rd., Battle Creek, Mich. 49017
Filed Oct. 15, 1986, Ser. No. 918,957
Int. Cl.[4] B21D *39/03;* B23P *11/00*
U.S. Cl. 29—430 18 Claims



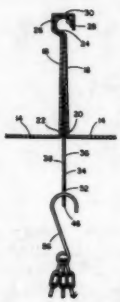
1. A method of manufacturing electric lift trucks comprising the steps of mounting on the main frame of the truck a plurality of components including a traction drive unit assembly at one or more first assembly stations, mounting on a battery box means adapted to receive a traction battery a plurality of components including one or more pump and motor assemblies at one or more second assembly stations, and mounting in the main frame said pre-assembled battery box means at a first assembly station.

4,811,474
FRICTION CLUTCH
Paul Maucher, Susbach, and Lothar Huber, Bühl, both of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany
Continuation of Ser. No. 343,209, Jan. 27, 1982, Pat. No. 4,660,700, which is a continuation of Ser. No. 81,924, Oct. 4, 1979, abandoned. This application Feb. 20, 1987, Ser. No. 16,880
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1978, 2843289
The portion of the term of this patent subsequent to Apr. 28, 2004, has been disclaimed.
Int. Cl.[4] B23P *11/02*
U.S. Cl. 29—446 2 Claims



1. A method of making a friction clutch wherein a diaphragm spring is tiltably mounted on a clutch cover between a first seat at the cover and a second seat at that side of the diaphragm spring which faces away from the cover and the second seat is urged against the diaphragm spring by holding means which are stamped out of the material of the cover and are bent so as to extend through apertures of the diaphragm spring, comprising the steps of stamping the holding means from the material of the cover and providing the holding means with holding regions for the second seat; bending the holding means in their entirety first in a substantially axial direction to intermediate positions; mounting the diaphragm spring and the second seat including placing the diaphragm spring against the first seat so that the holding means, in the intermediate positions thereof, extend through the apertures of the diaphragm spring and placing the second seat against the diaphragm spring; and bending the holding means in their entirety in the radial direction until the holding regions overlie the second seat.

4,811,475
PLANT HANGER
John C. Morton, Jr., Ocala, Fla., assignor to Jodac, Inc., Ocala, Fla.
Filed Jul. 29, 1987, Ser. No. 80,994
Int. Cl.[4] B21D *39/00*
U.S. Cl. 29—521 1 Claim



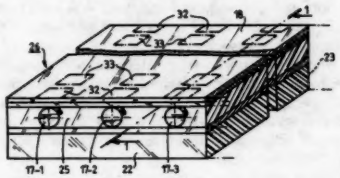
1. The method of suspending an article beneath a pan roof of the type including at least one pair of laterally adjacent elongated pan roof sections each including a lower flexive horizontal panel portion and wherein adjacent longitudinal margins of the panel portions include integral closely juxtaposed and upwardly projecting flanges extending therealong and joined together along upper marginal edges thereof spaced appreciably above the lower marginal edges integral with said panel portions, said method including providing an elongated upstanding generally planar body constructed of at least reasonably stiff and shape retentive material and including opposite ends and opposite face sides and edges extending between said ends and wherein the upper end of the body includes a plurality of integral angulated tangs struck from said body, projecting outward from said face sides and inclined outwardly from said body toward the lower end of said body with the outer lower ends of said tangs being sharpened and further wherein the lower end of said body includes support means from which an article to be suspended from said roof may be removably supported, applying an upward force on the transverse central area of the horizontal panel portion of one of said roof sections sufficient to upwardly bow the last mentioned horizontal panel portion sufficient to reduce the horizontal spacing between the lower marginal edges of the corresponding upwardly projecting flanges an amount causing a space to open up between one of the flanges thereof and the opposing flange of the adjacent roof section of a width greater than the thickness of said upper end, including the tangs supported therefrom, upwardly inserting said upper end between the last mentioned flanges and maintaining said upper end in position therebetween while releasing the upward thrust on said horizontal panel portion of said one roof section.

4,811,476

METHOD OF MANUFACTURING A MAGNETIC TRANSDUCER INCLUDING A PLURALITY OF HEADS

Philippe Raulin, Hericourt; Jean-Pierre Messer, Grosne; Bernard Cherbuy, Belfort, and Jacques Estavoyer, Bavilliers, all of France, assignors to Bull, S.A., Paris, France

Filed Jan. 12, 1988, Ser. No. 143,064
Claims priority, application France, Jan. 16, 1987, 87 00474
Int. Cl.[4] G11B 5/42
U.S. Cl. 29—603 24 Claims



1. A method for manufacturing a magnetic transducer adapted for the recording and/or reading of data on a magnetic carrier (12), this transducer including at least one row of p magnetic heads (T1, T2, T3), each of these heads comprising an elongated magnetic core provided with an excitation winding, comprises forming a winding (such as E1) of insulated conductor wire on each elongated magnetic core (such as 17-1);

making at least one elementary block (26) by disposing p cores, each provided with a winding, on a support plate (20) having two opposed edges (22 and 23), in such a manner that these p cores extend between these two edges;

embedding all of these p cores in a film (25) of hardenable insulating substance;

attacking the surface (54) of said film, after hardening of this substance, to expose two first groups of turns (29 and 30) on each winding, said two first groups of turns being located respectively in the vicinity of each of the ends of said winding;

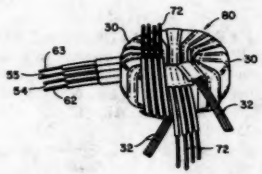
and forming, on said surface (54), contact zones (P-1, P2, . . . , P-p, 37c) connected to said first groups of turns, in such a manner as to allow connecting these windings to an electrical control circuit.

4,811,477

METHOD OF WINDING TOROID TRANSFORMERS

Robert D. Sylvester, Jr., Dover; Paul C. Horn, Somersworth, and Vincent J. Bober, Rochester, all of N.H., assignors to GFS Manufacturing Company, Inc., Dover, N.H.

Continuation of Ser. No. 892,416, Aug. 4, 1986, abandoned, which is a division of Ser. No. 707,135, Mar. 1, 1985, Pat. No. 4,631,511. This application Jun. 19, 1987, Ser. No. 61,644
Int. Cl.[4] H01F 41/08
U.S. Cl. 29—605 11 Claims



1. A method for making a toroid transformer having an annular core of permeable material and at least two windings, and having optimized mutual inductance among the windings comprising the steps of:

forming a first winding by radially winding a conductor about the annular core in substantially circumferentially equally spaced turns;

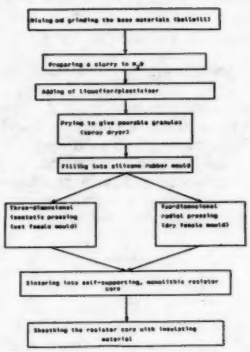
forming a second winding by arranging a plurality of conductor filaments in substantially parallel, coplanar relationship and securing to one side of the filaments a first elongate strip of electrically insulating material and securing a second elongate strip of electrically insulating material to the other side of the plurality of filaments and to the first strip to contain the filaments between the strips and to form a flat, multifilar strap, and radially winding the flat, multifilar strap about the annular core, the elongate strip serving to maintain the substantially parallel, coplanar relationship of the filaments without crossover during winding about curved or irregular toroid surfaces and serving as electrical insulation between turns of the multifilar strap second winding and between the second and first windings.

4,811,478

PROCESS FOR THE PRODUCTION OF A LIGHTNING ARRESTER AND PRODUCTS PRODUCED THEREBY

Günther Maier, Wettingen; Joseph Mosele, Biberist, and Roger Perkins, Baden-Rütihof, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Division of Ser. No. 809,339, Dec. 16, 1985, Pat. No. 4,729,053. This application Aug. 31, 1987, Ser. No. 90,913
Claims priority, application Switzerland, Feb. 7, 1985, 551/85
Int. Cl.[4] H01C 17/02
U.S. Cl. 29—613 7 Claims


Mixing and grinding the base materials (bottle mill)
Preparing a slurry to H_2O
Adding of ligno/formplasticizer
Drying to give pourable granules (spray dryer)
Filling into silicone rubber mould
Three-dimensional isostatic pressing (wet female mould)
Top-plane/normal radial pressing (dry female mould)
Sintering into self-supporting, monolithic resistor core
Sheathing the resistor core with insulating material

1. In a process for the production of a lightning arrester having an active resistor core made of a voltage-dependent resistance material based on ZnO, including the steps of mixing ZnO powder mixed with additional metal oxide powders, molding the mixture, then subjecting the molded product to heat treatment and sintering the improvement comprising the steps of converting the powder mixture containing ZnO powder and other metal oxide powders into pourable granules, and filling a highly flexible hollow mould with said pourable granules to form a shape similar to the final shape of a resistor core, and cold-pressing the mould to form a monolithic compact moulding corresponding to the final shape of the resistor core with at least 40% of the theoretical density, and then dense sintering said precompacted moulding to a density of at least 90% of the theoretical value to form a single monolithic resistor core which can be machined and contacted at both its ends, provided with an insulator jacket and assembled with other components into a finished lightning arrester element.

4,811,479

PROCESS FOR PRODUCING POTENTIOMETER RESISTANCES

Kurt Oelsch, Glockenstrasse 4, 1000 Berlin 37 (West), Fed. Rep. of Germany

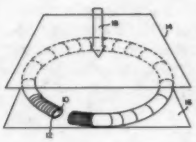
PCT No. PCT/EP86/00640, § 371 Date Jul. 27, 1987, § 102(e) Date Jul. 27, 1987, PCT Pub. No. WO87/03417, PCT Pub. Date Jun. 4, 1987

PCT Filed Nov. 7, 1986, Ser. No. 90,253

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1985, 3542227

Int. Cl.[4] H01C *17/04*

U.S. Cl. 29—618 1 Claim



1. A method of making potentiometer resistors having a winding of a selected value of electrical resistance, said winding being wound on a solid annular core of oblong cross section and forming opposite flat surfaces, of which one is to serve as contact surface for engagement by a slider, comprising the steps of

providing a solid annular core having a circular cross section,

winding on said core a wire winding, the value of the electrical resistance of which is smaller than said selected value,

subsequently deforming said solid core with said winding thereon to said oblong cross section by compressing it between flat, parallel surfaces to produce said flat contact surfaces while stretching the wire to such an extent that the winding assumes said selected value of resistance.

4,811,480

COMPONENT SUPPLY APPARATUS

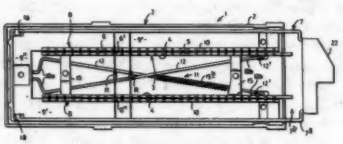
Peter J. W. Noble, Dorchester, and Geoffrey D. Maskens, Blandford, both of Great Britain, assignors to Ambotech Limited, Dorchester, England

Continuation of Ser. No. 858,189, filed as PCT GB85/00348 on Aug. 5, 1985, published as WO86/01366 on Feb. 27, 1986, abandoned. This application Dec. 18, 1987, Ser. No. 134,564

Claims priority, application United Kingdom, Aug. 7, 1984, 8420064; Nov. 20, 1984, 8429272; Dec. 12, 1984, 8431311

Int. Cl.[4] B23Q *7/10*

U.S. Cl. 29—809 1 Claim



1. Apparatus for supplying electrical components for insertion into a printed circuit board, said apparatus having a plurality of dispensers, each dispenser comprising:

a horizontally disposed rectangular base;

a pair of parallel spaced-apart support walls extending vertically upward from said base, the top edge of each said support wall being serrated to define a series of troughs arranged in opposed pairs each for supporting a component between said support walls with a respective lead of the component resting in a respective one of the opposed pair of troughs;

a downwardly sloping end portion formed on each said support wall at one end of said base to guide a component having its leads placed on said end portion downwardly and out of the dispenser;

a horizontally disposed frame defining a rectangular aperture having a pair of longitudinal edges, said frame normally being seated on the base in a rest position with said support walls projecting upwardly through the frame aperture adjacent respective ones of said longitudinal edges of the aperture;

a pair of transport walls extending upwardly from said frame along said longitudinal edges of the frame aperture adjacent said support walls of said base, the top edge of each said transport wall being serrated to define a series of troughs arranged in opposed pairs each for receiving the leads of a component to support the component between said transport walls, the troughs of said transport walls being located below the troughs of the support walls in the rest position of said frame;

guide means coupling said base and said frame together for limited movement of said frame relative to said base while maintaining said frame parallel to said base, said guide means permitting movement of said frame relative to said base in the upward direction and in the direction towards the one end of said base;

biasing means acting to bias said frame into its rest position relative to said base; said apparatus further having

a plurality of actuating members, each actuating member engageable with a corresponding dispenser;

a plurality of selection members, each selection member carrying some of said plurality of actuating members into and out of engagement with the corresponding dispensers;

a plurality of control members, each being connected to some of said plurality of actuating members and each comprising a control rod to which the connected actuating members are rotatably mounted and a channel-member fixedly mounted to the control rod, the control rod being movable along the lengthwise axis thereof and the channel-member being rotatable about an axis offset therefrom to move the connected actuators to effect displacement of the frame of a dispenser selected by the selection member;

so that each component is lifted from said support walls of said base by said transport walls of said frame, shifted towards said one end of said base and again deposited on said support walls at a position nearer said one end of said base such that a leading component is deposited on said end portions of said support walls and thereby dispensed from said dispenser.

4,811,481

METHOD OF BEADING DEFORMABLE ELECTRODES

Aldo S. Berchielli, Westerly, R.I., assignor to Yardney Corporation, Pawcatuck, Conn.

Filed Sep. 27, 1985, Ser. No. 780,765

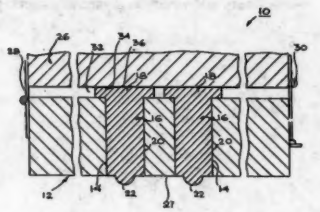
Int. Cl.[4] H01R *43/00*

U.S. Cl. 29—825 1 Claim

1. An improved method of beading deformable electrodes, said method comprising:

a. forming a plurality of spaced depressions in at least one surface of an electrode of sintered plaque of one of silver, nickel and cadmium metal, said surface being deformable only under increased pressure, by positioning a deforming

tool comprising a flat plate having a plurality of spaced steel pins releasably secured thereto bearing depression - imparting steel protrusions extending from the free ends thereof below the bottom of said plate, such that said protrusions contact said deformable electrode surface, said protrusions having a strength greater that that of said electrode surface, said electrode surface being not readily subject to plastic flow at low pressure, forcing said protru-



sions into said deformable electrode surface under pressure and thereafter withdrawing said protrusions from said deformed electrode surface; and,

b. adhesively binding non-conductive beads selected from plastic, glass, ceramic and mixtures thereof in said depressions so as to collectively form a non-conductive separator on said surface, said beads being readily crushable and/or deformable by said electrode surface.

4,811,482

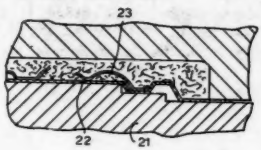
METHOD FOR PRODUCING MOLDED CIRCUIT BOARDS

Kenneth W. Moll, 5 Carrol St., East Northport, N.Y. 11731

Filed Aug. 5, 1987, Ser. No. 81,837

Int. Cl.[4] H01K 3/22

U.S. Cl. 29—848 **7 Claims**



1. In a method for fabricating circuitry for electronic components in which the circuitry has three-dimensionally disposed electrical conductors and an array of flat terminal pads on an exposed surface connected to the conductors, the steps of

forming temporary, bonded junctions between electrical conductors in the circuitry and a temporary substrate at predetermined terminal sites in which the area of each junction constitutes the area of an eventual terminal pad and with the conductors passing out of the plane of the substrate between junctions

establishing a mold within which to encapsulate the electrical conductors, at least a portion of the surface of the substrate comprising at least a portion of the interior of the mold,

injecting hardenable molding material into the mold to encapsulate the conductors and to surround the backs and sides of each of the terminal pads and

separating the mold from the hardened molding material including separating the temporarily bonded junctions between the substrate and the electrical conductors to expose the terminal pads.

4,811,483

DRY-SHAVING APPARATUS WITH SELF ADJUSTING BLADES

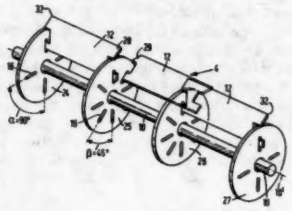
Eppe Bakker, Drachten, and Eduard W. Tietjens, Eindhoven, both of Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 943,474, Dec. 16, 1986, abandoned. This application Jun. 8, 1988, Ser. No. 206,982

Claims priority, application Netherlands, Dec. 20, 1985, 8503521

Int. Cl.[4] B26B 19/14

U.S. Cl. 30—43.6 **6 Claims**



1. A dry-shaving apparatus comprising a longitudinally extending shear plate provided with hair-entry apertures; an associated longitudinally extending cutter rotatable about an axis of rotation, said cutter including a spindle coaxially positioned with respect to said axis of rotation; the shear plate having a central portion shaped as a part of a cylindrical surface and formed with the hair-entry apertures, said central portion partly surrounding the cutter; cutting elements movable relative to the cutter in a substantially radial direction, each cutting element having a cutting edge at its radial end; and more than two coaxial discs axially spaced from each other and formed with slots extending in a substantially radial direction, said coaxial discs being rigidly mounted on said spindle; each cutting element having oppositely disposed axially projecting connecting portions for insertion of the cutting element into facing slots in two adjacent discs, the connecting portions being movable in the slots in a substantially radial direction.

4,811,484

DRY-SHAVING APPARATUS

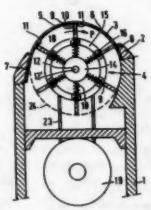
Willem S. Wijma, Drachten; Eduard W. Tietjens, Eindhoven; Eppe Bakker, and Albert Hoekstra, both of Drachten, all of Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 943,479, Dec. 16, 1986, abandoned. This application Jun. 8, 1988, Ser. No. 205,600

Claims priority, application Netherlands, Dec. 20, 1985, 8503519; Dec. 20, 1985, 8503520; Dec. 20, 1985, 8503521; Oct. 17, 1986, 8602606

Int. Cl.[4] B26B 19/14

U.S. Cl. 30—43.6 **2 Claims**



1. A dry-shaving apparatus comprising a housing; a longitudinally extending shear plate; a holder for the shear plate, said

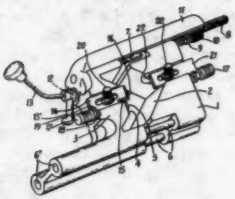
holder being removable from the housing; a longitudinally extending cutter rotatable relative to the shear plate and including a carrier having cutting elements movable in a substantially radial direction relative to the carrier; the shear plate having a central portion shaped as a part of a circularly cylindrical surface and two peripheral portions respectively adjoining the central portion; the shear plate having a first transition between one peripheral portion and its central portion, a cutting edge of each cutting element at its radial end changing from a free path to a constrained path in the vicinity of the first shear-plate transition, and having a second shear-plate transition between the other peripheral portion and its central portion, a cutting edge of each cutting element at its radial end changing from a constrained path to a free path in the vicinity of the second shear-plate transition; each cutting element having a cutting edge at its radial end, and at least one guide wall provided on the housing and adjoining the shear plate forming a part of at least one transition between said constrained and free path, the radial ends of the cutting elements also being in contact during a further part of the cutter revolution with said guide wall whereby cutting elements enter and leave the transitions reducing the effects of collisions between the cutting elements and the shear plate.

4,811,485

TOOL FOR DRESSING AN ELECTRIC CABLE

Robert Roux, 7 Rue Verte, Tuffe - 72160 Connerre, France

Filed Nov. 3, 1987, Ser. No. 116,334
Claims priority, application France, Nov. 27, 1986, 86 16569
Int. Cl.[4] H02G *1/12*
U.S. Cl. 30—90.1 **8 Claims**



1. A tool for dressing an electric cable comprising a body in which is provided a journaling passage for receiving the end of a cable to be stripped, said body including at least one cutter extending across said passage over a settable distance and having two cutting edges, one cutting edge being substantially transverse to said passage and the other cutting edge being adjacent the first cutting edge and perpendicular to the passage axis, said body comprising two opposing blocks movable with respect to one another and defining between them said journaling passage, wherein at least one of said opposing body blocks includes a notched portion which defines a lateral extent of the journaling passage and the other of said opposing body blocks includes an opposing surface which defines an opposing lateral extent of said passage and which, upon movement of said blocks toward each other, extends into said notched portion of said opposing body block.

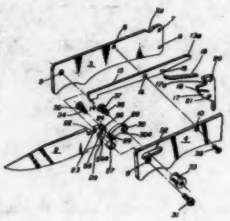
4,811,486

POCKET KNIFE

William D. Cunningham, Rocky Mount, N.C., assignor to Atlanta Cutlery Corporation, Conyers, Ga.

Continuation of Ser. No. 931,875, Nov. 17, 1986, abandoned, which is a continuation of Ser. No. 762,336, Aug. 3, 1985, abandoned. This application Oct. 1, 1987, Ser. No. 105,519
Int. Cl.[4] B26B *3/06*
U.S. Cl. 30—161 **4 Claims**

1. A knife comprising a base element, a knife blade pivotally mounted on said base element about a fixed pivot and having an activation notch offset from one side of said blade to define a transverse surface intersecting said fixed pivot, a sliding knob reciprocally mounted on said base element for imparting opening and closing movement to said knife blade, a connecting arm having one end pivotally connected with said blade and having the other end pivotally connected with said sliding knob, said connecting arm being of arcuate configuration and defining near one end thereof an activation notch engaging surface initially in engagement with said transverse surface, and the pivotal connection between said connecting arm and



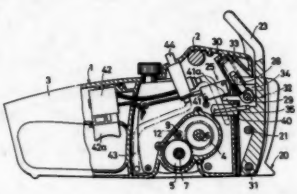
said knife blade being spaced from said fixed pivot whereby initial blade opening movement of said sliding knob moves said activation notch engaging surface of said connecting arm with said transverse surface of said activation notch in the end of said knife blade thereby to initiate smooth opening movement of said knife blade and continuing opening movement of said sliding knob separates said notch engaging surface and said transverse surface and completes opening movement of said knife blade by imparting a continuous tension force to said connecting arm.

4,811,487

MOTOR-DRIVEN CHAIN SAW BRAKING/LOCKING APPARATUS

Kazuyuki Takahashi; Yasuhiro Oe, and Etushi Yamamoto, all of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed Dec. 13, 1984, Ser. No. 681,051
Claims priority, application Japan, Dec. 14, 1983, 58-236999
Int. Cl.[4] B23B *57/02*
U.S. Cl. 30—382 **9 Claims**



1. An electric motor driven chain saw braking/locking apparatus in which a cutting chain is wound around and supported by a guide bar projecting in a first direction from a housing having a front handle, said front handle being mounted on a front portion of said housing, said chain projecting from said front portion, said cutting chain being driven by an electric motor carried on said housing, comprising: a hand guard pivotally mounted on said housing between said cutting chain and said front handle with respect to said first direction; belt brake means and brake electrical switching means linked to said hand guard such that braking of said electric motor and cutting off of electric current flow to said electric motor are performed substantially simultaneously upon forward tilting of said hand guard, said belt brake means comprising a brake drum fixed to a drive shaft of said motor at a position receiving

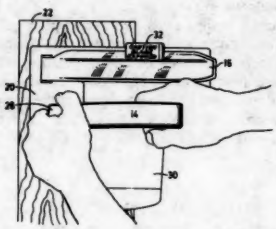
motor cooling air; a lock pin slidably engaged in an elongated hole formed in said front portion of said housing with said elongated hole extending in a second direction which is toward said hand guard and substantially parallel to said first direction, said elongated hole having a recess portion extending in a third direction which is transverse to said second direction; means for linking said lock pin with said hand guard such that when said locking pin is in a first position in said recess portion said forward tilting of said hand guard cannot occur; means, linked with said hand guard, for moving said lock pin out of said recess portion and to a second position in response to movement of said hand guard toward said chain; and a spring for basing said lock pin towards said hand guard and for urging said forward tilting of said hand guard in response to sliding movement of said lock pin in said second direction.

4,811,488

PORTABLE SAW WITH MOVABLE WARNING

Reubeu F. Press, 211 Sherman Canal, Vanice, Calif. 90291

Filed Nov. 4, 1987, Ser. No. 116,496
Int. Cl.[4] B23D 45/16
U.S. Cl. 30—391 **11 Claims**



1. A safe hand tool comprising:
a portable, hand-held circular saw including a drive motor and a circular blade;
a fixed upper guard means for protecting the user against engagement with the circular blade;
a movable lower guard means for normally protecting the user against engagement with the circular blade when the saw is not being actively used in cutting operations, said lower guard means being pivotally mounted to swing back and up toward the used as the saw engages material to be cut; and
prominent written warning means in a brillant or fluorescent color secured to said movable lower guard means for moving into the normal view area of the saw operator as the lower guard means swings back and up to expose the lower portion of the circular saw blade;
whereby a moving prominent warning sign alerts the saw operator to the danger of the exposed blade.

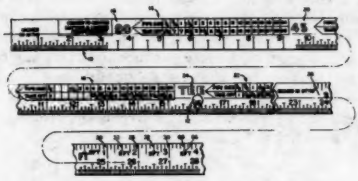
4,811,489

PIPE FITTERS TAPE MEASURE STRIP

Don W. Walker, P.O. Box 245, Arcadia, Tex. 77517

Continuation-in-part of Ser. No. 871,889, Jun. 6, 1986, Pat. No. 4,696,110. This application Sep. 28, 1987, Ser. No. 101,402
Int. Cl.[4] G01B 3/10
U.S. Cl. 33—759 **8 Claims**

1. A pipe fitter's measuring tape comprising:
a strip having two side surfaces,
one of said two side surface being marked adjacent one edge in 1-inch intervals and subdivided into 1/16-inch intervals with measuring lines extending perpendicular to said one edge, and
in each inch interval one of said measuring lines terminates in a slash line extending perpendicular to said one measuring line, and the remainder of said measuring lines in each inch interval of lines terminate in dots, the diameter of a dot located at a terminus of a measuring line indicating an



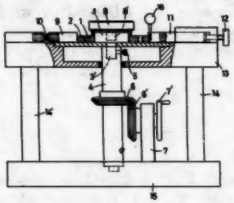
inch interval being greater than the diameter of a dot located at a terminus of the other measuring lines.

4,811,490

METHOD AND DEVICE FOR MEASURING CLEARANCES BETWEEN GEARS

Hiroshi Ueda, and Mamoru Sugimoto, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 19, 1988, Ser. No. 161,071
Claims priority, application Japan, Feb. 27, 1987, 62-46294
Int. Cl.[4] G01B 3/22, 7/14
U.S. Cl. 33—179.5 R **4 Claims**



1. A method for measuring clearances between gears in an internal gear assembly having an inner gear and an outer gear, said method comprising the steps of supporting said inner gear in position so as to be rotatable around its axis, setting said outer gear around said inner gear so as to be rotatable about its axis and movable in the direction of a centerline connecting the axis of said outer gear to the axis of said inner gear, positioning the center of a tooth space of either said inner gear or said outer gear and the center of a tooth of the other on said centerline, and moving said outer gear alternately in opposite directions along said centerline so as to abut said inner gear at either side, and measuring the distance by which said outer gear has moved with respect to the inner gear to measure the clearance between said inner gear and said outer gear.

4,811,491

TWO-AXIS DIFFERENTIAL CAPACITANCE INCLINOMETER

Alan C. Phillips, Los Altos, and Terence J. O'Brien, San Jose, both of Calif., assignors to Etak, Inc., Menlo Park, Calif.

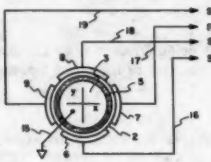
Filed Sep. 4, 1987, Ser. No. 93,017
Int. Cl.[4] G01C 9/06
U.S. Cl. 33—366 **1 Claim**

1. A two-axis inclinometer comprising:
an electrically conductive member;
first, second, third and fourth electrically conductive plates;
means for mounting said first and said second plates adjacent to opposite surfaces of said member so as to provide a gap between said first and said second plates and said member;
means for mounting said third and fourth plates adjacent to opposite surfaces of said member so as to provide a gap

between said third and fourth plates and said member, said first and said second plates being mounted orthogonal to said third and said fourth plates;

means for retaining a dielectric fluid in said gaps in such a manner that as said member and plates are inclined about a pair of orthogonal axes, the amount of said fluid in each of said gaps will change as a function of the angle of tilt of said member and said plates about said pair of orthogonal axes;

a pair of current sources for charging opposite ones of said plates relative to said member;



means for periodically switching said current sources between each of said opposite plates to compensate for variations in current from said sources;

means for periodically discharging said opposite plates relative to said member, said charging and said discharging producing a pair of sawtooth voltages; and

means for filtering and differentially amplifying said sawtooth voltages for providing an output signal which is proportional to the inverse of the differential capacitance between said opposite plates and said member as said member and said plates are tilted about said orthogonal axes.

4,811,492

CANT ANGLE SENSOR ASSEMBLY

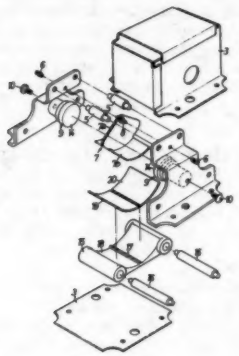
Yonehiro Kaksta; Kouichi Takigawa; Akio Noji; Shigeaki Kuwabara; Tadashi Shimada, and Michihiro Iida, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1987, Ser. No. 90,281

Claims priority, application Japan, Aug. 29, 1986, 61-132370[U]; Aug. 29, 1986, 61-203257; Nov. 12, 1986, 61-173559[U]

Int. Cl.[4] G01B *7/00*

U.S. Cl. 33—366 **7 Claims**



1. A cant angle sensor assembly, comprising:

a pendulum pivoted on a supporting system adapted to be mounted on an object whose cant angle is to be sensed, for swinging movement in a direction of tilt of the object;

a movable electrode provided on said pendulum and having a first and a second movable electrode plate;

a first stationary electrode plate fixedly mounted on the supporting system in an opposed relation to said one of said first and second movable electrode plates of said movable electrode at a predetermined gap, with an area of the first stationary electrode plate opposed to said one of first and second movable electrode plates being invariable despite vibration of the pendulum;

second and third stationary electrode plates fixedly mounted on the supporting system in an opposed relation to the other of said first and second movable electrode plates of said movable electrode plate at a given gap, so that with swinging movement of the pendulum, areas of the second and third stationary electrode plates opposed to the other of said first and second movable electrode plates are increased and decreased in a manner contrary to each other; and

an electric circuit arranged to detect an electrostatic capacitance between said movable electrode

and each of said second and third stationary electrode plates to provide a voltage corresponding to an amount of tilt of the object, wherein

said pendulum comprises a depending plate pivoted on the supporting system and an arcuate plate overhanging sideways from a lower end of said depending plate,

wherein said first movable electrode plate is formed on one of said depending plate and said arcuate plate

and said second movable electrode plate is formed on the other of said depending plate and said arcuate plate.

4,811,493

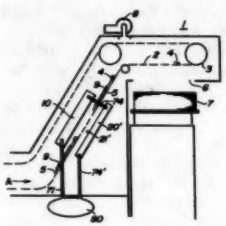
DRYER-COOLER APPARATUS

Joseph T. Burgio, Jr., 725 Jennings St., Bethlehem, Pa. 18017

Filed Aug. 5, 1987, Ser. No. 81,843

Int. Cl.[4] F26B *3/26*

U.S. Cl. 34—4 **12 Claims**



1. Dryer-cooler apparatus for curing a heat sensitive coating on a substrate passing adjacent said apparatus, comprising:

(A) a cooling plate comprising:

(1) a first flat surface adjacent said substrate,

(2) a second surface,

(3) first and second ends, and

(4) a plurality of coolant passages extending through said cooling plate from said first end to said second end, including:

(i) a first coolant passage, and

(ii) a last coolant passage;

(B) an end block abutting said cooling plate first end and having an opening extending therethrough;

(C) lamp means extending adjacent said cooling plate first flat surface and having an end portion with a height less than the diameter of said end block opening and extending into said opening;

whereby coolant is circulated through said first coolant passage and out of said last coolant passage to cool said cooling

plate and said lamp means end portion is free to move unencumbered within said end block opening without causing damage to said end block and said lamp as said lamp expands and contracts when cyclically heated and cooled during periodic operations of said apparatus.

4,811,494

REMOVAL OF WATER FROM CARBONACEOUS SOLIDS BY USE OF METHYL FORMATE

Frank Miller, 925 Robin Rd., Somerville, N.J. 08876

Filed Jan. 7, 1987, Ser. No. 1,255
Int. Cl.[4] F26B *3/00*
U.S. Cl. 34—9 **10 Claims**

1. A process for the removal of water from carbonaceous solids, said process comprising the steps of:

(a) contacting a carbonaceous solid containing water with methyl formate;

(b) removing the resultant methyl formate-aqueous mixture from the carbonaceous solids; and

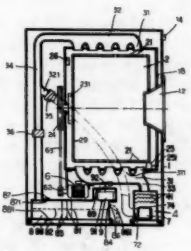
(c) recovering the dewatered carbonaceous solid.

4,811,495

LAUNDRY DRIER

Mijuel E. J. Huang, 183, Neihu Rd., Sec. 2; Suyueh Chao, 2-1, Lane 162, Szu Wei Rd.; Chin-Ching Yu, 31, Lane 4, Tunhua N. Rd., and Chi-Chu Hsu, 4F, No. 144, Chu Lin Rd., Yung Ho, all of Taipei, Taiwan

Filed Jan. 15, 1988, Ser. No. 144,101
Int. Cl.[4] F26B *11/02*
U.S. Cl. 34—131 **1 Claim**



1. A drying machine comprises :

an outer case having a port hole located in the front side wall;

a door mounted on the front side wall of the outer case in correspondence with the port hole for opening or closing said port hole;

a control panel disposed on the upper portion of said front side wall for operation;

a tub having a plurality of orifices evenly located in the periphery and an opening corresponding to said port hole for loading and unloading the laundry to be dried;

an inner case fixed between said outer case and tub having a hole corresponding to said port hole and opening;

a shaft rotatably and substantially horizontally supported by a side wall of the inner case with one end fixed coaxially on a side plate of the tub and the opposite end fixed with a grooved wheel which can be driven to rotate by a properly disposed motor through a belt;

a spraying duct adjacent to the periphery of the tub having several perpendicularly formed spraying openings fixed on the inner case;

a heating room having a series of heating elements and a blower with a suction end and a discharge end disposed underneath the series communicatively connected with said spraying duct for blowing hot air into the spraying duct when necessary;

a suction duct adjacent to the periphery of the tub, having a passage with an electromagnetic valve disposed therein and several suction openings formed substantially correspondingly to the spraying openings of the spraying duct, fixed in opposition to the spraying duct on the inner case;

a branch duct having an electromagnetic valve formed in the passage priorly to the prior electromagnetic valve and communicatively connected with the suction end of the blower;

a water tank having a hole, which can closed by a lid and formed at the top of the tank for adding clean water to a proper level, a drain hole, which can be sealed by a lid or other proper means and formed at the bottom of the tank for draining off the used water in the tank when necessary, and a leak hole located closely above the water surface for leaking the excess water automatically, fixed in the lower portion of the outer case and communicatively connected with the passage of the suction duct;

a series of orifice plates having a plurality of orifices formed in the submerged portions of the plates vertically and compartmentally fixed in the middle portion of the tank;

a vacuum apparatus disposed in the tank in opposition to the connection of the passage at a position higher than the water surface for discharging the air after a submergence;

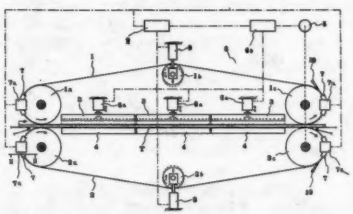
whereby, the electromagnetic valves are arranged in the way that one of the electromagnetic valves is open while the other valve is closed thus a drying process of the circulation of hot air under low pressure or vacuum along the route of said spraying duct, tub, suction duct, branch duct, blower and heating room and the discharge of circulated and submerged mixture of the used hot air are completed accordingly.

4,811,496

METHOD OF CORRECTING THE TRACK OF AN INTERMITTENTLY-RUNNING ENDLESS BELT IN A VENEER DRYER

Noriyuki Honda; Yukio Abe; Makoto Isobe, and Nobuhiro Nakata, all of Obu, Japan, assignors to Meinan Machinery Works, Inc., Obu, Japan

Filed Oct. 28, 1987, Ser. No. 114,197
Int. Cl.[4] F26B *9/04*
U.S. Cl. 34—144 **14 Claims**



1. Method of correcting the track of an intermittently running endless belt in an apparatus for drying a sheet of wood veneer, said apparatus having a pair of movable endless metal belts, a plurality of rolls, at least one of said rolls being driven to rotate intermittently, said endless belts being trained under tension round said rolls in such an arrangement along respective running track paths that at least one straight passage is formed by and between said endless belts through which a veneer sheet can be conveyed intermittently by said endless belts with intervening intervals of no belt movement, at least one pair of heating plates disposed adjacent above and below said veneer passage, at least one heating plate of the pair being movable alternately toward and away from its operative position in close proximity to its adjacent belt, in such timed relation to the intermittent movement of the endless belts that said movable heating plate is placed in said operative position

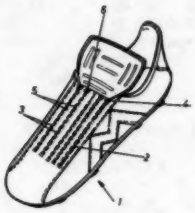
synchronously with each said interval of no belt movement; said apparatus further having means provided for each of said endless belts that is operable for releasing the tension of the corresponding endless belt, and at least one pair of power driven pushing members disposed adjacent the opposite lateral edges of each of said endless belts and operable to move toward and away from said lateral edges for moving the corresponding endless belt, if deflected laterally in either direction from its running track path, back to its running track path; said method comprising: releasing the tension in said endless belts by operating said releasing means after each predetermined number of said intervals of no belt movement occurring during said intermittent movement of said belts, and thereafter, if an endless belt is deflected in either direction, by operating the corresponding pushing members, moving said deflected endless belt laterally in a direction which causes said deflected belt to return to its said running track path.

4,811,497

SPORT SHOE

Ana I. Merino Ciudad, Carretera de Sax No. 10, Elda (Alicante), Spain

Filed Mar. 10, 1988, Ser. No. 166,453
Claims priority, application Spain, Mar. 18, 1987, 8700922
Int. Cl.[4] A43B *11/00, 5/00, 5/02*
U.S. Cl. 36—51 **1 Claim**



1. Sport shoe, such as a soccer boot characterized in that the cut of material corresponding to the vamp section of the boot is totally plain and has a series of cuts which extend from the top of the vamp towards the toe, these being parallel and close to each other, and connected by sewing lines to an inner elastic and flexible section which facilitates putting on and taking off of the boot or shoe.

4,811,498

SKI BOOT

Thierry Barret, Pringy-Gare, France, assignor to Salomon S. A., Annecy Cedex, France

Filed Aug. 6, 1986, Ser. No. 893,910
Claims priority, application France, Aug. 6, 1985, 85-12034
Int. Cl.[4] A43B *5/04, 7/20*
U.S. Cl. 36—117 **11 Claims**

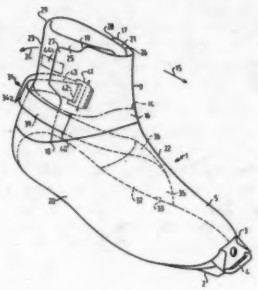
1. Sport boot especially intended for cross country skiing and comprising a flexible upper and a flexible shaft (9, 109) presenting a slit (19, 21, 119, 121) allowing the shaft (9, 109) to be opened so that the boot can be put on and taken off, means (31, 41, 131, 145, 141) for closing and opening the slit (19, 119) as desired and means (31, 41, 131, 145, 141) for clamping the foot (8) in the boot (1, 101), with said clamping means (31, 41, 131, 145, 141) comprising a first clamping strap (31, 131) having a first end (32, 132) attached to the inside of the boot (1, 101) in a first lateral area (33, 133) of a sole (2, 102) of the boot, located on a first side (22, 122) of the boot (1, 101), and, successively, from this first end (32, 132) on, a first section (35, 135) extending along the side of a foot (8) housed in the boot (1, 101), a second section (36, 136) bypassing the instep (37)of the foot, a third section (39, 139) at least partially bypassing the rear of the ankle joint, and an area (43, 143) of the second end (34, 134) cooperating with means (41, 145, 141) for tightening and releasing the strap (31, 131) as desired, wherein

(a) the shaft (9, 109) has a completely closed, continuous flexible front area (16, 116) with respect to which said slit (19, 119) is offset;

(b) the first lateral area (33, 133) of the sole (, 102) is located at a level at least partially including the level of the metatarsals (7) of the foot (8);

(c) the first and second sections (35, 36, 135, 136) of the first strap (31, 131) extend along the inside of the upper (15, 105) at a level which at least partially includes the level of the metatarsals (7); and

(d) the third section (39, 139) of the first strap (31, 131) extends along the shaft (9, 109) essentially on the outside,



between a lower limit level (60) defined by the lower level of the lower attachment of the Achilles tendon to the calcaneum (61) and an upper limit level (6) defined by the lower level of the malleoli (13), and is connected to the second section (36, 136) by a first passage opening (40, 140) placed in the shaft (9, 109) on a second side (20, 120) of the boot (1, 101), opposite said first side (22, 122), between the front area (16, 116) of the shaft (9, 109) and the slit (19, 119) that the third section (39, 139) of the first strap overlaps, so that tightening of the first strap (31, 131) simultaneously causes clamping of the foot (8) in the boot (1, 101) and closing of the shaft (9, 109), and so that the release of the first strap (31, 131) simultaneously allows opening of the shaft (9, 109) and release of the foot (8).

4,811,499

HYGENIC PLASTIC FOOTWEAR INSERT

Harold A. Jensen, 31 Annadea Rd., Brockton, Mass. 02402

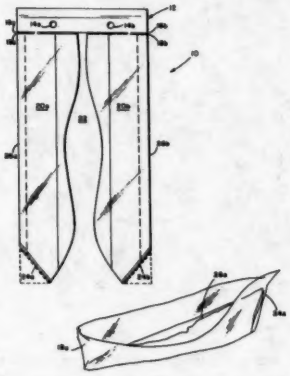
Filed Apr. 15, 1988, Ser. No. 181,917
Int. Cl.[4] A43B *17/14*
U.S. Cl. 36—10 **1 Claim**

1. A block-sealed hanger for footwear inserts which comprises:

a header;

paired two-ply inserts depending from said header and secured thereto by release lines, said inserts having open inner edges facing one another to define the opening of each respective insert, sealed outer edges defining the sole of the insert;

a first seal line spaced apart from said release line forming one end of the insert; and



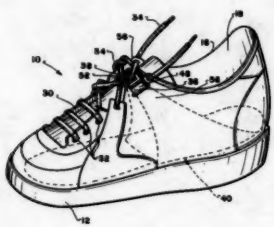
a second seal line spaced apart from the first seal line defining the other end of the insert.

4,811,500

ARTICLE OF FOOTWARE HAVING AN ADJUSTABLE INSTEP SUPPORTING INSERT

Angelo Maccano, Simi Valley, Calif., assignor to L. A. Gear, Inc., Los Angeles, Calif.

Filed Feb. 6, 1987, Ser. No. 11,621
Int. Cl.[4] A43B *11/00, 7/18*
U.S. Cl. 36—91 **6 Claims**



1. A shoe comprising:

a flexible shoe sole;

a shoe upper attached to said shoe sole and defining a cavity for receiving a foot, said shoe upper having left and right side walls, each of said side walls having a separate lacing portion which includes a row of lace openings for receiving a shoe lace;

each of said sidewalls also having an elongated slit-like opening located between the next-to-uppermost and uppermost ones of said lace openings and substantially aligned therewith;

a sling member disposed within said cavity, having opposing side quarters and a widened central portion intermediate said side quarters, said widened central portion being fabricated of an elastomeric material and being shaped to support the instep portion of the foot;

said side quarters each having an upwardly extending narrowed strap portion passing through a respective one of said slit-like openings in said shoe upper, each of said narrowed strap portions having an opening in the upper end thereof adapted to receive a shoe lace therethrough; and

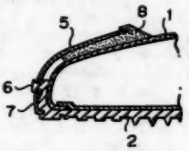
a shoe lace extending through the next-to-uppermost lace opening in each of said side walls, hence through said upper end opening in the opposite one of said narrowed strap portions, and thence reversing its direction and extending back through the uppermost lace opening in the same side wall, for releasably securing said outwardly extending narrowed strap portions of said sling member to said shoe upper, and so that tightening of said shoe lace suspends said elastomeric central portion of said sling member in said cavity in an adjustable manner.

4,811,501

FOOTWEAR

Kenji Okayasu, Gyoda, Japan, assignor to Rikio Co., Ltd., Gyoda, Japan

Filed Jul. 10, 1987, Ser. No. 71,933
Claims priority, application Japan, Jul. 10, 1986, 61-105976
Int. Cl.[4] A43B *7/26;* A43C *13/14*
U.S. Cl. 36—94 **8 Claims**



1. Working footwear comprising:

an upper,

a sole,

toe protector means covering the toe of said upper,

said sole having a raised portion at the periphery of the toe, the said raised portion including a plurality of outwardly extending protrusions formed integrally therewith,

said protrusions including a head portion of a greater diameter than a shaft portion connecting said head portion with said raised portion, and

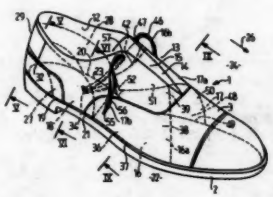
said toe protector means having a plurality of apertures formed therein for receiving said protrusions therethrough and to receive said shaft portion therein to connect said toe protector means to said raised portion of said sole.

4,811,502

SPORT SHOE

Thierry Barret, Pringy Gare, France, assignor to Salomon S.A., Annecy, France

Filed Jun. 4, 1987, Ser. No. 58,001
Claims priority, application France, Jun. 6, 1986, 86 08257
Int. Cl.[4] A43B *5/04, 5/00, 23/28*
U.S. Cl. 36—117 **13 Claims**



1. In a sport shoe comprising a flexible upper (3, 3') and a sole (2, 2'), the improvement comprising

means for securing a foot in said shoe (1, 1'), said securing means comprising

(a) first and second flexible fastening ties (16, 17), each of said ties having a first end (36, 48) attached inside said shoe (1, 1'), in a lateral zone (37, 49) of said sole located respectively on a first (22) and a second (24) side of said shoe (1) at the level of the metatarsal (5), and successively, beginning with this first end (36, 48), a first section (38, 50) extending laterally along a foot (7) housed in said shoe (1, 1'), at the level of the metatarsal (5), inside said shoe (1, 1'), and independently of said upper (3, 3'), a second section (39, 51) bypassing an instep (40) respectively up to said second (24) or said first (22) side of said shoe (1), at the level of the metatarsal (5), inside said shoe (1) and independently of said upper (3, 3'), with said second sections (39, 51) of said first and second flexible fastening ties (16, 17), superposed freely over each other, and a second end zone (45, 46, 55, 56);

(b) means for selectively tightening and releasing said first and second flexible fastening ties (16, 17) by mutual movable fastening of their second end zones (45, 46, 55, 56);

(c) a third flexible fastening tie (18, 18'), having first and second ends (19, 20) attached inside said shoe (1, 1'), in lateral zones (21, 23) of said sole located respectively on said first (22) and second (24) sides of said shoe (1, 1'), behind the level of the metatarsal (5) and in front of the level of the calcaneum (25), first and second sections (27, 28, 27', 28') extending laterally along said foot (7), at least partially inside said shoe (1), and independently of said upper (3, 3'), respectively on said first (22) and second (24) sides of said shoe (1), and turning towards the rear respectively from said first (19) and second (20) ends of said third flexible tie (18, 18'), and a third section (29, 29') interconnecting said first and second sections (27, 28) of said third flexible tie (18, 18'), behind said upper (3, 3') and independently thereof, with said third section (29, 29') of said third flexible tie (18, 18') extending along said foot (7) by the rear between a lower limit level (30) defined by a lower level of the lower attachment of the Achilles tendon to the calcaneum (25) and an upper limit level (31) defined by the lower level of the malleoli (7); and

(d) said tightening means comprise, on each of said first and second sections (27, 28, 27', 28') of said third flexible fastening tie (18, 18'), under the level of the malleoli (7) and inside said shoe (1, 1'), a respective guide (34, 35) for the corresponding deviation and sliding of said second (17) or said first (16) flexible fastening tie, such that said first and second flexible fastening ties (16, 17) have, between their second sections (39, 51) and their second end zones (45, 46, 55, 56), third sections (46, 56) which complement each other when said second end zones (45, 46, 55, 56) are fastened together, to bypass the foot (7) by the front between said guides (34, 35), tightening of said first and second flexible fastening ties (16, 17) also causing the tightening of said third flexible fastening tie (18, 18'), and said first and second flexible ties (16, 17) on the one hand, and said third flexible tie (18, 18') on the other hand, can apply the respective mutually convergent forces (F_1, F_2) against said foot (7), downwardly against said sole (2).

4,811,503

SKI BOOT

Shinichi Iwama, Sayama, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Filed Feb. 24, 1987, Ser. No. 18,332

Claims priority, application Japan, Oct. 22, 1986, 61-161931[U]; Oct. 30, 1986, 61-166842[U]; Nov. 15, 1986, 61-175925[U]

Int. Cl.[4] A43B 5/04; A43C 11/00

U.S. Cl. 36—119 **17 Claims**

1. A ski boot having an outer shell containing a front cuff having opposed side portions, a rear cuff, and an inner boot, having an instep portion, fitted within said outer shell wherein the improvement comprises at least one elongated continuous flexible member having first and second end portions, means engaging said elongated member between its ends for guiding same into crossing relationship on the inner boot instep portion, boot fastening means provided on the rear portion of the outer shell, said first and second end portions of said elongated member being connected to said fastening means.

4,811,504

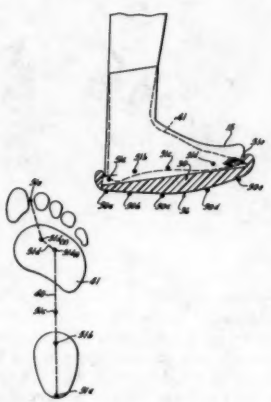
WALK EASE SKI BOOT SOLES

Clinton R. Bunke, 103 S. Towanda - Ste. 7, Normal, Ill. 61761

Filed Jan. 28, 1988, Ser. No. 149,682

Int. Cl.[4] A43B 5/00, 13/00

U.S. Cl. 36—132 **33 Claims**

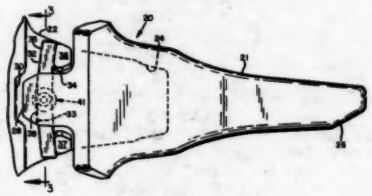


1. A sole or plantar surface configuration for footwear that has been deliberately configured to retain a foot in a substantially rigid and inflexible manner but which interferes with a normal walking gait, said surface configuration serving to facilitate walking and including opposed forward and rearward ends and at least one roll point area spaced rearwardly from the forward end thereof, said one roll point area lying in a plane angularly disposed relative to the longitudinal axis of the planar surface and in a direction towards the medial surface of the footwear, wherein the plantar surface configuration is canted angularly relative to the vertical axis for a portion of its length and in the proximity of the forward end thereof.

4,811,505
EXCAVATING TOOTH ASSEMBLY

Robert K. Emrich, Portland, Oreg., assignor to ESCO Corporation, Portland, Oreg.

Continuation of Ser. No. 937,982, Dec. 4, 1986, Pat. No. 4,671,900. This application Feb. 16, 1988, Ser. No. 155,892
The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.
Int. Cl.[4] E02F 9/28
U.S. Cl. 37—142 R 1 Claim



1. An excavating tooth comprising an adapter and a point, said adapter having a nose at one end for coupling to said point, said point having an earth engaging edge at one end constituting the tooth forward end and a socket at the other end for coupling to said adapter by movement along the tooth longitudinal axis, said point having a tongue extending rearwardly beyond said socket, a plurality of cooperating generally helical thread means on said nose and in said socket whereby said point is rotated to install the same on said adapter, and a pair of vertically spaced ears externally of said nose and only on one side thereof, and lock means engaging said ears and tongue for releasably connecting said point and adapter and to prevent reverse rotation of said point when the same is installed on the said adapter, said lock means consisting essentially of a relatively elongated pin member having a generally rectangular cross-section providing a surface facing said nose and opposed forward and rearward surfaces, said rear surface engaging said tongue, said forward surface engaging said spaced ears, said pin surface facing said nose being equipped with a recess, said nose being equipped with a transverse bore in alignment with said surface recess, and a plug member in said bore resiliently engaging said pin member, said pin member having the larger dimension of its rectangular cross section extending parallel to said longitudinal axis.

4,811,506
EMOTIONAL GIFT OR GREETING DEVICE IN THE STYLIZED REPRESENTATION OF A HUMAN HEART

Satish Mehta, 3136 DeLuna Dr., Rancho Palos Verdes, Calif. 90274

Continuation-in-part of Ser. No. 696,339, Jan. 30, 1985, Pat. No. 4,608,771. This application May 23, 1986, Ser. No. 866,497
The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.
Int. Cl.[4] G09F 19/12
U.S. Cl. 40—427 15 Claims

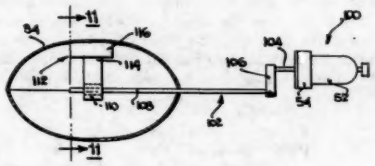
1. An emotional gift and decorative device in the stylized representation of a human heart to provide a connotation of a movement thereof, said device comprising:

(a) a container having a container section with a three dimensional representation of a human heart therein and which has an interior chamber and an exterior surface and which is externally presented and readily viewable in the container, said exterior surface also being capable of being shifted outwardly and inwardly with respect to the remaining portion of the representation of the human heart to provide a pulsating action, and which representation of the human heart has a configuration and approximate shape of a stylized human heart such that when pulsating it would appear as a representation of a bearing human heart,

(b) a source of stored electrical energy located with respect to said container,

(c) motive means operatively connected to said source of stored electrical energy and being powered thereby, and

(d) a drive shaft connected to said motive means and having an off-set portion extending into said interior chamber of said representation of the human heart, and

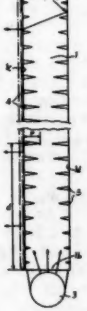


(e) at least one element operatively engagable with said off-set portion of said drive shaft in said interior chamber and being secured to an interior surface forming said chamber, said element being rocked upwardly and downwardly by rotation of said off-set portion to cause the exterior surface to be moved inwardly and outwardly thereby in a cyclic pattern only in response to rocking movement of said element as a result of energization of said motive means, and which exterior surface is readily viewable to thereby simulate a beating movement of a human heart.

4,811,507
APPARATUS FOR THE DISPLAY OF ILLUMINATED TRANSLUCENT DOCUMENTS

Pierre A. Blanchet, Avenue du 11 novembre, 87250 Bessines, France

Filed Apr. 13, 1987, Ser. No. 37,604
Claims priority, application France, Apr. 18, 1986, 86 05626
Int. Cl.[4] G09F 13/18
U.S. Cl. 40—546 18 Claims



1. In a front lit illuminated panel for directional illumination of a translucent display, comprising:

at least one light source emitting a light flux;

a plate of transparent material including striations and having light re-emitting elements, said light re-emitting elements re-emitting flux meeting said elements from said at

least one light source and exiting from said plate of transparent material to light said display;

said light re-emitting elements in said plate being arranged and/or distributed in such a way that their light re-emitting power increases as the distance away from the light source increases; and

said plate having on at least one of its front and back surfaces striations whose depth increases in a direction as the distance away from said light source increases; and wherein

the improvement consists essentially in that said striations are individual and distributed along lines parallel to a lighted field of the plate and spaced from one another on each of said lines, the length (l) of said striations along the respective lines increasing and the space (a) along the same line between said individual striations decreasing in the direction away from a viewer observing said display.

4,811,508

WEDGE CONNECTION ASSEMBLAGE

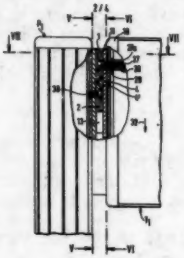
Karl L. Engelbach, Dillenburg, Fed. Rep. of Germany, assignor to Weyel KG, Haiger, Fed. Rep. of Germany

Filed May 11, 1987, Ser. No. 48,199

Claims priority, application Fed. Rep. of Germany, May 13, 1986, 3616031

Int. Cl.[4] G09F *15/00*

U.S. Cl. 40—607 **16 Claims**



1. A wedge connection assemblage for connecting a first member to a second member, comprising:

first and second wall means externally of said first member and defining first and second locking surfaces which are perpendicular to one another, said first wall means extending toward said second member which has a third and fourth wall means externally thereof and defining third and fourth locking surfaces which are perpendicular to one another, said third wall means extending toward said first member in laterally spaced relation to said first wall means, said second and fourth wall means being in opposing relation to one another;

a first wedge member stationarily provided on said second locking surface between said first and third locking surfaces, said first wedge member having a first sidewall in abutting relation with said first locking surface and a second sidewall contiguous with said first sidewall, said second sidewall being inclined to said second locking surface so as to define a first acute angle therewith, said second sidewall also being inclined to said first locking surface so as to define a second acute angle therewith;

a second wedge member stationarily provided on said fourth locking surface between said first and third locking surfaces, said second wedge member having a third sidewall in abutting relation with said third locking surface and a fourth sidewall contiguous with said third sidewall, said second wedge member being in vertically aligned relation to said first wedge member so that said second and fourth sidewalls extend parallel and opposed one another, a fifth sidewall on said first wedge member facing oppositely to said first sidewall and a sixth sidewall on said second wedge member facing oppositely to said third sidewall, an engagement of said second and fourth sidewalls causing, due to the influence of gravity and the weight of said first member, a relative lateral movement between said first and second wedge members and an engagement of said fifth sidewall with said third locking surface and an engagement of said sixth locking surface with said first locking surface.

4,811,509

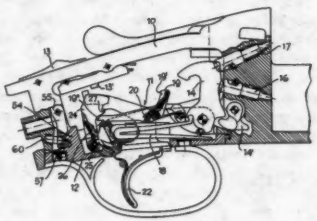
MONOTRIGGER MECHANISM FOR TRAPSHOOTING GUNS

Pier G. Beretta, Gardone V.T., Italy, assignor to Fabbrica D'Armi P. Beretta S.p.A., Italy

Filed Nov. 3, 1987, Ser. No. 116,654

Int. Cl.[4] F41C *19/18*

U.S. Cl. 42—42.01 **2 Claims**

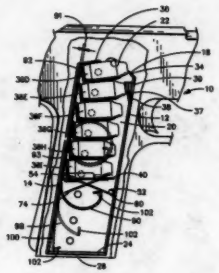


1. A monotrigger mechanism for breeches of double-barrelled, trap shooting guns, which comprises an underguard; means for coupling the underguard to and detaching the underguard from the breech; two hammers pivoted on said underguard; said hammers being biassed in a firing direction by respective cross-bow springs and being coordinated with respective firing pins corresponding to the respective barrels of the gun; a pair of levers pivoted on said underguard respective levers being arranged to arrest respective hammers in a cocked position; a trigger pivoted on said underguard and attached to a pendular mass for the separate control of the pivotal displacement of the respective levers in a predetermined sequence thereby to disengage the respective hammers according to the sequence; said pendular mass having a pair of shoulders spaced apart from each other for sequential engagement with respective levers, following a first and a second action of said trigger; a lever support pivotally mounted on said underguard for actuating said pivoted levers through said pendular mass; a plurality of arresting notches provided on said lever support in spaced apart relation in the longitudinal direction of the gun; means mounting said trigger on the lever support for sliding movement in the longitudinal direction of the gun; a blocking latch on said trigger having a tooth selectively engageable with respective of said notches to locate the trigger in different longitudinal positions; and a pre-loaded retaining spring biassing said tooth into engagement with respective notches, said blocking latch being seated in a cavity provided in an upper part of said trigger; said latch having a maneuver portion thereon, protruding from said cavity; said maneuver portion having an opening for receiving a rod by which the tooth can be withdrawn from a notch against the action of said biassing spring to permit adjustment of the longitudinal position of the trigger by sliding movement of the trigger along the longitudinal access.

4,811,510
CARTRIDGE MAGAZINE AND METHOD FOR INCREASING NUMBER OF STORED CARTRIDGES

M. Gaines Chesnut, 1171 Barlow Dr., Kremmling, Colo. 80459

Filed Oct. 8, 1987, Ser. No. 107,484
Int. Cl.[4] F41C *25/02*
U.S. Cl. 42—50 21 Claims



1. A magazine for holding cartridges, each having a diameter, comprising:

first and second end walls and first and second side walls defining a chamber having a bottom end and an opened end;

a follower comprising a cartridge support having a cartridge contact surface and mounted in said chamber for movement between a first follower position adjacent to said opened end and a second follower position adjacent to said bottom end;

means for moving said follower from said second to said first position, said means for moving having a portion extending below said cartridge contact surface, wherein the distance said moving means extends below said cartridge contact surface is less than about the diameter of each of the cartridges when said follower is in said second follower position; and

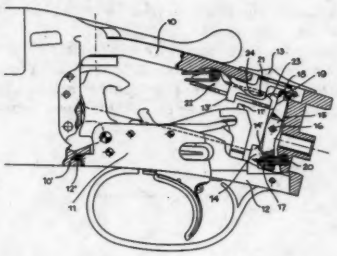
a first leg and a second leg attached to said cartridge support, each leg having a free end spaced from said cartridge support, wherein said means for moving is movable with respect to each of said free ends of said first and second legs.

4,811,511
DEVICE FOR RAPIDLY ENGAGING AND DISENGAGING THE TRIGGER MECHANISM IN THE BREECH OF A GUN

Pier G. Beretta, Gardone V.T., Italy, assignor to Fabbrica D'Armi P. Beretta S.p.A., Italy

Filed Nov. 3, 1987, Ser. No. 116,444
Claims priority, application Italy, Feb. 3, 1987, 5117 A/87
Int. Cl.[4] F41C *17/02*
U.S. Cl. 42—70.06 6 Claims

1. In a device for the rapid engagement and disengagement of a trigger mechanism in a breech of a gun, the trigger mechanism having member elements premounted on an underguard having a front portion and a rear portion, the breech having a lower portion with the underguard applied thereto and an upper portion with a safety sled slidably mounted thereon, the improvement which comprises: a tongue provided in the front portion of said underguard; a complementary seat provided in said breech for receiving said tongue; a hook provided in the rear portion of said underguard, said hook facing toward the interior of said breech; a pivotal lever in said breech, having a tooth and a terminal spaced apart thereon; the lever being pivotally mounted in the breech for pivotal movement between positions in which said tooth engages with and disengages from said hook respectively for blocking and unblocking said trigger mechanism in the breech; said terminal being arranged to interact with said safety sled for controlling manually the disengagement of said monotrigger mechanism; and a

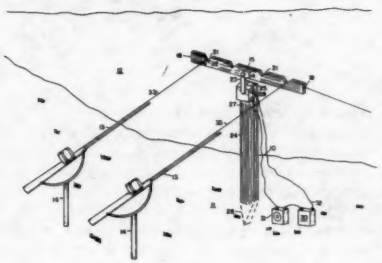


spring acting on said pivotal lever biassing the tooth into engagement with the hook insuring the engagement of said trigger mechanism.

4,811,512
FISHERMAN'S ALERTING APPARATUS

Robert O. Amos, 3215 Baird Ave., Lakeland, Fla. 33805

Filed Mar. 23, 1987, Ser. No. 28,916
Int. Cl.[4] A01K *97/12*
U.S. Cl. 43—17 4 Claims



1. A apparatus for alerting a fisherman of a bite on a fishing line associated with one or more unattended rod and reel assemblies, said apparatus comprising:

(a) a rigid elongated horizontal member having upper and lower edges, opposed end extremities, front and rear surfaces, and several parallel straight notches recessed into said upper edge in perpendicular disposition to said front and rear surfaces and symmetrically disposed about the midpoint of the horizontal member with respect to said end extremities.

(b) a straight rigid support member having a pointed lower extremity capable of being forced into the ground to dispose the support member in an upright orientation, forward and rear surfaces, and an upper extremity, the length of said support member, measured between said upper and lower extremities, being greater than the length of the horizontal member,

(c) electrical on-off switch means attached to said support member adjacent said upper extremity and having a resilient metal contact arm that extends vertically above said upper extremity to a distal end which releasibly attaches to the midpoint of the horizontal member, and thereby positions said horizontal member perpendicularly to said support member in T configuration while permitting movement of said horizontal member in the direction

between forward and rear surfaces of the support member,

(d) electrically driven audible signal means,

(e) a battery power source, and

(f) electrical circuitry which causes the battery to energize the audible signal means when said switch is in the on position, whereby

(g) fishing lines tautly held by said notches cause forward movement of the horizontal member when a fish bites on the line, said movement placing the switch means in its on position which activates the audible signal means.

4,811,513

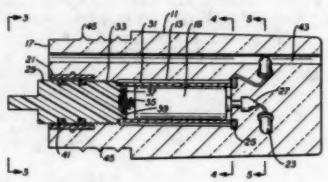
LIGHTED LURE HEADPIECE

George Grobl, 1578 Graff Avenue, San Leandro, Calif. 94577

Filed Jul. 23, 1987, Ser. No. 76,745

Int. Cl.[4] A01K *85/00*

U.S. Cl. 43—17.6 2 Claims



1. A flashing lure headpiece comprising

a generally solid cylindrical plastic body having a cylindrical open-ended cavity formed in the rear end thereof for closely surrounding and container a cellular battery, a portion of the length of said cavity including an internally threaded portion,

at least one LED embedded in the front end of said plastic body including internal circuitry to effect intermittent operation thereof,

an electrical connector embedded in said plastic body at the internal end of said cavity, said connector including a ring member and a post member, said post member being disposed concentric to said ring member and co-planar therewith and formed to electrically contact one electrical contact of a cellular battery,

an electrical circuitry connecting said LED with said electrical connector,

a threaded plug formed for closing the open end of said cavity in watertight sealed relation and threadably engaged with the threaded portion of said cavity, said plug including ring seals disposed on the rear end of said plug between the threaded portion of said plug and the rear end of said plastic body and sealing said plug in said cavity at least when said plug is disposed in said cavity at its forwardmost position,

a tubular electrical connection extending from the front end of said plug and formed to contain a cellular battery and to contact said ring member of said electrical connector,

spring means disposed in said tubular electrical connector urging said battery toward the post member of said electrical connector, and

electrical circuitry for contacting the other electrical contact of said battery and electrically connecting it with said tubular electrical connector.

4,811,514

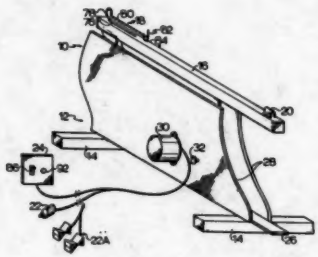
ICE FISHING RIG

William Jordan, Box 415, Pine Falls, Manitoba, Canada R0E 1M0

Filed Jul. 15, 1988, Ser. No. 219,478

Int. Cl.[4] A01K *87/00*

U.S. Cl. 43—19.2 18 Claims



1. A fishing jigger comprising:

a rod holder;

means for supporting a fishing rod on the holder in a longitudinal orientation;

pivot means supporting the rod holder for pivotal movement about a transverse pivot access;

an elongate, longitudinally oriented cam follower mounted on the rod holder;

cam means for engaging the cam follower;

cam drive means including a rod connected to the cam, a crank connected to the rod for pivotal movement with respect thereto about a transverse crank axis and a pair of longitudinally spaced guides positioned on opposite sides of the rod between the crank and the cam to limit movement of the rod laterally of the rod.

4,811,515

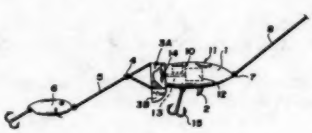
SELF-PROPELLED FISHING DEVICE

Anthony A. D'Aquino, R.D. 1, 317A, Cipriano Rd., Clintondale, N.Y. 12515

Filed Aug. 6, 1987, Ser. No. 82,295

Int. Cl.[4] A01K *85/06*

U.S. Cl. 43—26.1 8 Claims



1. A self-propelled fishing device comprising:

a submersible waterproof body adapted to be propelled in a submerged state below the surface of a body of water;

power drive means for propelling said device, said power drive means including:

an electric motor sealably mounted within said submersible body, said electric motor including output means extending to a rear surface of said submersible body;

a propeller mounted on an output shaft of said output means, outside said rear surface of said submersible body; and

battery means located in a separate, sealed chamber, operatively connected with said electric motor to selectively drive same;

said submersible waterproof body including swiveling con-

necting means for connecting said submersible body between a fishing line of a fishing pole and a lure line; and a single steering rudder mounted in a lower portion of said submersible body.

4,811,516

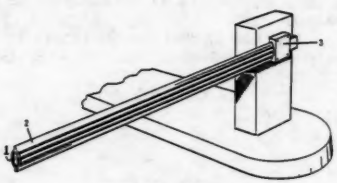
BARRIER GATE ARM

Howard A. Anderson, Pittsburgh, Pa., assignor to Mobay Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 914,909, Oct. 3, 1986, abandoned. This application Sep. 30, 1987, Ser. No. 102,932

Int. Cl.[4] E01F *13/00*

U.S. Cl. 49—49 2 Claims



1. A movable gate arm comprising (i) a stiffening member made from wood, said member being encased within a sleeve made from extruded polycarbonate and (ii) a gear motor, said motor being the means for moving said arm.

4,811,517

VEHICLE DOOR OR BODY SECTION, ESPECIALLY FOR A PASSENGER MOTOR VEHICLE

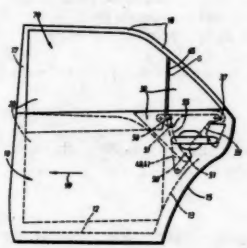
Dieter Eckert, Magstadt; Wolfgang Henseler, Tübingen, and Hans Luetze, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 22, 1987, Ser. No. 111,054

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1986, 3635924

Int. Cl.[4] E06B *3/32*

U.S. Cl. 49—145 16 Claims



1. A body section especially for a passenger motor vehicle, comprising body means essentially made of an inner and outer body panel, and window means arranged above said body means including an approximately rectangularly shaped, vertically displaceable window and an adjoining, approximately triangularly shaped window part, the window and window part being operable to be substantially completely lowered into the body means for purposes of opening the window means, the window part being pivotal about an axis arranged at least approximately perpendicularly to the plane of its window pane within the area of a corner facing the window, the window and the window part extending in a common plane and the window being provided within the area of its upper corner facing the window part with an inclined portion in such a manner that in the lowered condition of the window and of the window part, the front edge of the window part extends adjacent the inclined portion and at a distance from the latter.

4,811,518

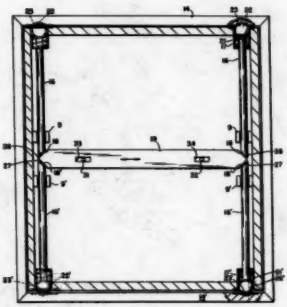
DOOR

Nicholas F. Ladisa, 10296 Quiet Pond Ter., Burke, Va. 22015

Filed Nov. 28, 1986, Ser. No. 935,935

Int. Cl.[4] E05D *7/02*

U.S. Cl. 49—193 13 Claims



13. A door structure for a double-action pivoting door having two side edge which selectively function as either an opening side edge or a hinge side edge, said door being operable within a door frame comprising a lintel and a sill, said door structure comprising:

A. a pair of cam means in said lintel and a pair of cam means in said sill, each said cam: means being substantially vertically aligned with one said side edge;

B. two pairs of vertically aligned cam-engaging means in said door, each pair being vertically aligned with one said cam means in said lintel and with one said cam means in said sill;

C. means for automatically forming a hinge at said hinge side edge when said door in closed position is pushed or pulled near the other said side edge, which thereby functions as said opening side edge, to cause unseating of one said pair of cam-engaging means from said cams in said lintel and in said sill at said opening side edge and seating of said pair of cam-engaging means into said cams in said lintel and said sill at said hinge side edge; and

D. front and rear surface which are in parallel and disposed between said side edges, said door being openable by pushing against either said surface without using a handle and said hinge forming means being operably unconnected to said handle.

4,811,519

AUTOMOTIVE WINDOW MOUNTING ASSEMBLY

Peter N. Gold, 465 North Wood Road, Rockville Centre, N.Y. 11570

Filed Jul. 5, 1988, Ser. No. 215,270

Int. Cl.[4] E05F *11/38*

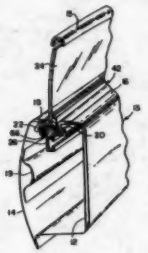
U.S. Cl. 49—375 8 Claims

1. A window panel mounting assembly for operatively coupling a window panel having a bottom edge to a mechanism for raising and lowering the window panel within an automobile door of the type having a peripheral frame extending upwardly from a window sill line thereon to define a window opening, the peripheral frame adapted to support the top and side peripheral edges of the window panel when the window panel is in a fully raised position, said assembly, comprising:

a sash element capable of being operatively coupled to the mechanism for raising and lowering the window;

an upwardly extending window panel engagement element fixedly attached to said sash element and extending upwardly therefrom, said window panel engagement element having a cam surface thereon having a predetermined width and including a pair of inwardly extending shoulders thereon;

a window panel receiving element having a pair of opposed sides having first ends thereof fixedly attached to an inner and outer side of the window panel along the bottom edge



thereof, said opposed sides of said receiving element having resilient second ends extending downwardly from the bottom edge of said window panel and defining a receiving portion spaced a predetermined distance to resiliently deflect outwardly upon engaging said cam surface of said upwardly extending window panel engagement element; and

cam means formed on said second ends of said opposed sides of said window panel receiving element for resiliently capturing said shoulder on said upwardly extending window panel engagement element.

4,811,520

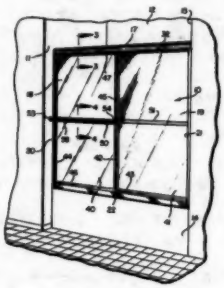
SHOWER DOOR ASSEMBLY

John A. Duggan, Schaumburg, and Robert P. Gombas, Hickory Hills, both of Ill., assignors to Universal-Rundle Corporation, New Castle, Pa.

Continuation of Ser. No. 937,361, Dec. 3, 1986, abandoned. This application Aug. 11, 1988, Ser. No. 231,666

Int. Cl.[4] E05D *13/00*

U.S. Cl. 49—409 **12 Claims**



1. An enclosure for a tub or shower comprising a header member having a first exterior face and a second exterior face;

at least two panel members connected to said header and at least one of said panel members being adapted to slide along said header relative to said other panel member;

at least one of said panel members having a removable panel means for serving as a handle or a holder;

said first exterior face on said header having a first decorative configuration disposed thereon and said second exterior face having a second decorative configuration disposed thereon; and,

said removable panel means having a decorative configuration that is the same as or corresponds with said first or second decorative configuration on either of said first or second exterior faces on said header.

4,811,521

TRUING DEVICE FOR HONES

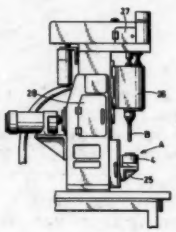
Yoshio Nakae; Akiyo Kinoshita, and Koichi Tanaka, all of Kyoto, Japan, assignors to Kabushiki Kaisha Nisshin Seisakusho, Nakagun, Japan

Filed Oct. 27, 1987, Ser. No. 113,162

Claims priority, application Japan, Nov. 5, 1986, 61-170581[U]; Nov. 5, 1986, 61-170582[U]

Int. Cl.[4] B24B *5/00*

U.S. Cl. 51—5 D **8 Claims**



1. A truing device for hones comprising a truing tool and a tool holding device for holding the truing tool,

said truing tool being provided with a hole to insert a honing tool,

at least a part of an inner peripheral surface of the hole being a cylindrical surface having the same diameter as that of the honing tool,

at least a part of said hole inner peripheral surface being provided with cutting edges for grinding hones,

a tool holder means being shakably held by a jig body of said tool holding device within a range of three dimensional minute angles,

the tool holder means being provided with a recessed insertion hole,

said truing tool being attachably and removably housed in the recessed insertion hole,

whereby said truing tool can smoothly follow movement of said honing tool during truing working.

4,811,522

COUNTERBALANCED POLISHING APPARATUS

Gerald L. Gill, Jr., 3502 E. Atlanta Ave., Phoenix, Ariz. 85040

Filed Mar. 23, 1987, Ser. No. 29,133

Int. Cl.[4] B24B *5/00*

U.S. Cl. 51—131.1 **7 Claims**

1. Apparatus for polishing a surface of a thin wafer of a material, comprising

(a) at least one station having a polishing surface;

(b) a frame;

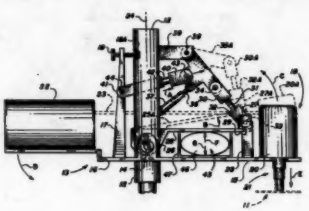
(c) elongate carrier means pivotally mounted on said frame;

(d) a floating pressure head mounted on said carrier means over said polishing surface and including

(i) a base including a lower portion for maintaining the wafer in contact therewith and against said polishing surface, and an upper portion having a planar surface area,

(ii) a force transmitting member contacting said base and having an upper planar surface, a lower surface, and edge means at a periphery of said lower surface and contacting said planar surface area of said base, and

(iii) a rod mounted on said carrier means and including an upper end and a lower end with a flat bottom planar surface contacting said upper planar surface of said force transmitting member, said bottom planar surface of said rod including a circular peripheral edge and pressing against said upper planar surface of said force transmitting member, said pressure of said bottom surface of said rod against said upper planar surface of said force transmitting member being transmitted to said base through said edge means to press said wafer against said polishing surface;



said base and force transmitting member moving between at least two operative positions with respect to said lower planar end of said rod,

(e) a first operative position with said flat bottom surface of said rod contacting and parallel to said upper planar surface of said force transmitting member; and,

(f) a second operative position with said base and force transmitting member canted with respect to said flat bottom surface of said rod such that said flat bottom surface of said rod is canted away from and only contacts said upper planar surface at points on said circular periphery of said lower planar end,

at least one of said polishing surface and said pressure head being rotatable.

4,811,523

APPARATUS FOR FINE MACHINING OF PLANE SURFACES OF DISK-SHAPED WORKPIECES HAVING AN UNMACHINED BEARING SIDE AND A SLIGHT WALL THICKNESS

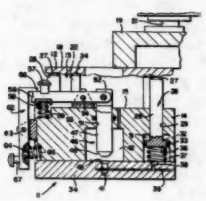
Heinz-Gunter Schmitz, Remscheidl, and Johann Konken, Hurth, both of Fed. Rep. of Germany, assignors to Supfina Maschinenfabrik Hentzen KG, Remscheid, Fed. Rep. of Germany

Filed Apr. 21, 1986, Ser. No. 853,838

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1985, 3514741

Int. Cl.[4] B24B *5/00*

U.S. Cl. 51—131.1 **15 Claims**



10. An apparatus for the fine machining of the plane surfaces of disk-shaped workpieces having an unmachined bearing side and slight wall thickness, comprising:

a rotatable chuck including a plurality of support pins adjustable to a fixed height, and at least one displaceably mounted support element located between adjacent pairs of pins, said pins and support elements being located about a periphery of said chuck for engagement with the unmachined side of the workpieces, wherein:

said support elements include a pin and means for resiliently mounting the pin in the axial direction of the pin, said means for resiliently mounting a support element pin including a hydraulic cylinder and a piston displaceable within the hydraulic cylinder; and

each support element pin is biased by its resilient mounting means into an initial position according to which the support element pin extends beyond the fixed height of its adjacent support pins.

4,811,524

CYLINDER GRINDING MACHINE WITH TRACING AND DIMENSIONAL AND SURFACE CHECKING

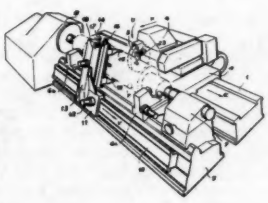
Valeriano Corallo, Torino, Italy, assignor to Giustina International S.P.A., San Mauro Torinese, Italy

Filed Mar. 20, 1987, Ser. No. 28,480

Claims priority, application Italy, Mar. 20, 1986, 19820 A/86

Int. Cl.[4] B24B *51/00*

U.S. Cl. 51—165 R **4 Claims**



1. A grinding machine for elongated generally cylindrical workpieces, comprising:

a longitudinally extending front bed formed with a headstock and a tailstock for rotatably receiving an elongated generally cylindrical workpiece to be ground and for rotating said workpiece about a generally horizontal axis;

a longitudinally extending rear bed extending parallel to said front bed and provided with:

a tool carriage longitudinally shiftable along said rear bed parallel to said axis,

a drive connected to said tool carriage for longitudinally displacing same along said rear bed,

a wheelhead mounted on said tool carriage for displacement thereon perpendicular to said axis, and

a grinding tool rotatable on said wheelhead and engageable with a surface of said workpiece for grinding same;

a further longitudinally extending bed rigid with said front bed and disposed on a longitudinal side thereof opposite that along which said rear bed extends, said further bed extending parallel to said axis;

a measuring carriage displaceable on said further bed parallel to said axis and provided with a further drive operable independently of the drive connected to said tool carriage for displacing said measuring carriage along said further bed;

a support extending upwardly from said measuring carriage alongside said workpiece; and

gauge means mounted on said support and including a measuring caliper having arms diametrically straddling said workpiece for measuring a diameter thereof, and at least one sensor disposed between said arms, juxtaposed with

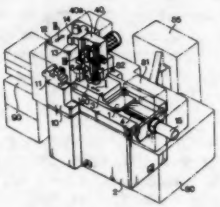
said surface, and tracing structural characteristics and defects of said surface.

4,811,525

GRINDING HEAD FOR A GRINDING MACHINE

Soosaku Kimura; Masaya Itoh, and Takeshi Okabe, all of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1988, Ser. No. 159,960
Int. Cl.[4] B24B *41/00*
U.S. Cl. 51—166 MH 11 Claims



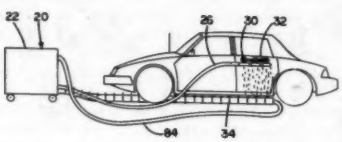
1. A grinding head for a grinding machine comprising:
a grinding head body;
a supporting member movably mounted on said grinding head body;
a jaw provided on said supporting member at an end portion thereof;
a grinding-wheel spindle assembly including a center shaft one end of which is secured to said grinding head body and the other end is supported by said jaw, a sleeve rotatably mounted on said center shaft through hydrostatic bearings, and a grinding wheel secured to said sleeve;
first actuating means for moving said supporting member between an operating position where said center shaft is supported by said jaw and a retracted position apart from said center shaft;
a clamping device for securing said supporting member to said grinding head body;
wheel driving means for rotating said sleeve for grinding operation; and
second actuating means for opening and closing said jaw, for removing and attaching the grinding wheel.

4,811,526

STORABLE WATER CURTAIN SANDING AIR SYSTEM

Jerome R. Roestenberg, 11 Woodpecker Ln., Levittown, N.Y. 11756

Filed Jun. 4, 1987, Ser. No. 58,081
Int. Cl.[4] B24B *55/00*
U.S. Cl. 51—270 24 Claims



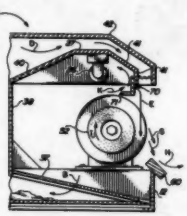
1. A storable water curtain sanding aid system for use in conjunction with a work surface, said system comprising:
spigot means for delivering a liquid,
means for holding said spigot means in desired relationship to a work surface,
a tray for collecting the liquid from said spigot means as well as particulate matter resulting from working on said work surface,
a support body,
storage means held by said support body, connected to one end of the tray, for storing the tray,
said tray comprising a bottom and side walls which include top edges,
said side walls being substantially vertical with respect to the bottom of a portion of the tray that is positioned for collecting, and
at least one edge of a portion of the tray that is in storage being proximate to the tray bottom.

4,811,527

PARTICLE COLLECTION SYSTEM WITH SPOILER

Jon A. Ruopsa, 11834 S. Ki Rd., Phoenix, Ariz. 85044

Filed Dec. 14, 1987, Ser. No. 132,792
The portion of the term of this patent subsequent to Oct. 6, 2004, has been disclaimed.
Int. Cl.[4] B24B *55/06*
U.S. Cl. 51—270 1 Claim



1. Abrading apparatus including
(a) a housing having a front wall and a rear wall and a particle receiving basin between said front and rear walls;
(b) a circular abrading wheel mounted on a axle in said housing above said particle receiving basin and having a cylindrical outer peripheral portion;
(c) a motor mounted in said housing and operatively associated with said axle to rotate said axle and abrading wheel, a workpiece normally being held against and contacting said wheel in a position such that particles abraded from said workpiece by said wheel are downwardly thrown toward said basin, air flowing around and adjacent said outer portion of said wheel in a circular path of travel when said abrading wheel is rotated by said motor;
(d) a first air channel formed in said housing for downwardly directing a vertically oriented curtain of air over said portion of said grinding wheel contacting said workpiece and carrying abraded particles into said basin;
(e) particle depository means in said housing having a floor and an upright wall attached to and extending upwardly from said floor;
(f) a second air channel in said housing between said basin and particle depository means;
(g) recirculating fan means in said housing having an intake and an exhaust port;
(h) a third air channel in said housing between said particle depository means and said intake ports of fan means;
(i) a fourth air channel in said housing between said exhaust port of said fan means and said first air channel, the cross sectional area of said fourth air channel tapering from said exhaust port to said first channel means to accelerate the flow of air through said fourth air channel;
(j) a baffle member attached to said housing and adjacent said abrading wheel to deflect outwardly away from said wheel said air flowing around said rotating abrading wheel; said particle depository means and said first, second, third and fourth air channels and basin being shaped and dimensioned such that
(k) air continuously flows in a closed circuit through said

first channel, said depository means and said fourth channel; and,

(l) air flows through said second channel into said depository means in a first direction of travel and flows from said depository means into said third channel in a second direction of travel and, when said air flow changes from said first to said second direction of travel, at least certain of said abraded particles in said air generally continue in said first direction of travel and strike said upright wall of said particle depository means and fall toward said floor under the force of gravity.

4,811,528

METHOD FOR PRODUCTION OF ENVOLUTE GEAR TOOTH FLANKS

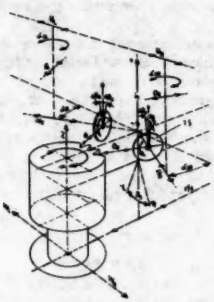
Gerd R. Sommer, Dietikon, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Oct. 28, 1985, Ser. No. 792,210

Claims priority, application Switzerland, Nov. 3, 1984, 5520/84

Int. Cl.[4] B24B *19/00*

U.S. Cl. 51—287 **15 Claims**



1. A method of fabricating involute gear tooth flanks both with and without geometric correction on a machine having at least one machining tool and in which method machining motions, feed motions and traversing motions between the machining tool and a gear blank are performed, comprising the steps of:

confining machining contact between said at least one machining tool and said gear blank at least to the immediate vicinity of a selectable machining point on said machining tool;

performing said feed motions such that said machining point is guided substantially along a selectable predeterminate machining line lying at least approximately on a tooth flank surface of a gear tooth of a gear being fabricated from said gear blank for generating a gear generatrix envelope;

said step of confining machining contact entails confining said selectable machining point within a predeterminate machining region of said at least one machining tool during machining by means of a supplementary feed motion of said at least one machining tool;

said selectable machining point of said at least one machining tool is continuously displaced within said predeterminate machining region during machining by a controllable machining point motion related to machining tool wear; and

said controllable machining point machine being superimposed upon said supplementary feed motion of said at least one machining tool and a supplementary feed motion of said gear blank towards said at least one machining tool.

4,811,529

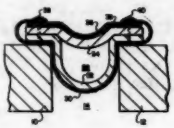
FIRE RESISTANT FLEXIBLE SEAL

Kendall R. Harris; Leonard C. Spriggs, and Ralph J. Block, all of Houston, Tex., assignors to B&B Progessive Material & Technologies, Inc., Houston, Tex.

Filed Jul. 1, 1982, Ser. No. 394,252

Int. Cl.[4] E04B *1/66*; F16J *15/16*

U.S. Cl. 52—396 **19 Claims**



1. A fire resistant flexible seal for sealing a breach between movable architectural barriers, said seal comprising:

a first flexible blanket of insulating material affixed to each side of said breach and defining a first open loop therebetween; and

a second flexible blanket of insulating material affixed to each side of said breach and defining a second open loop therebetween, wherein an enclosed air space is defined between said first blanket of insulating material and said second blanket of insulating material.

4,811,530

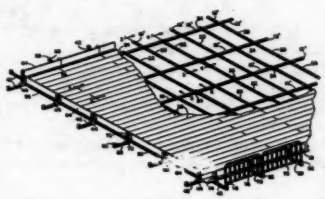
PORTABLE PLATFORM

Jon V. Eyerly, Salem, Oreg., assignor to J V Industries, Inc., Salem, Oreg.

Filed Jan. 30, 1987, Ser. No. 8,839

Int. Cl.[4] E04C *2/38*

U.S. Cl. 52—6 **11 Claims**



1. A portable platform, comprising:

(a) a plurality of elongated floor support members spaced apart laterally to form outer margin and intermediate floor supports,

(b) each floor support member having a plurality of longitudinally spaced pairs of axially aligned cross members extending laterally in opposite directions, the confronting pairs of cross members of adjacent support members being in axial alignment,

(c) a plurality of elongated coupling members each removably connected at its opposite ends to a confronting pair of cross members,

(d) a plurality of elongated locking members each removably interengaging an adjacent pair of support members in between adjacent coupling members for securing said support members against lateral displacement,

(e) a plurality of elongated floor members overlying the assembly of support members, cross members, coupling members and locking members and releasably secured together at their longitudinal edges, and

(f) a plurality of perimeter floor confining members removably connected to the outer ends of the floor support members and outwardly extending perimeter cross members for confining the floor members against horizontal displacement relative to the underlying floor support assembly.

4,811,531

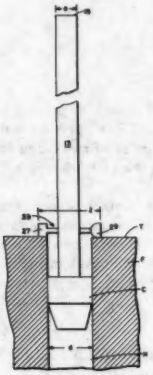
METHOD AND DEVICE FOR PLUGGING A HOLE

Ivan Vallerand, 46 Lakeview Ave., Waltham, Mass. 02154

Filed Oct. 13, 1987, Ser. No. 107,555

Int. Cl.[4] E04G *23/02*

U.S. Cl. 52—127.5 **15 Claims**



1. A device to assist a person in inserting a cork plug into a hole made in the concrete foundation of a building from a standing position, the hole being made for termite control purposes, said hole having a diameter d, said device comprising:

a. an elongated rod, said rod having a cross-sectional diameter less than d and including:

i. a bottom end, and

ii. a top end, the length of the rod being such that a person can insert the bottom end into the hole from a standing position,

b. pin means on said bottom end of said rod for mounting a cork plug thereto, said pin extending outward therefrom, and

c. depth-setting means mounted on said rod for limiting the extent to which said rod may be inserted into said hole.

4,811,532

CASING WITH FIXED AND/OR MOVABLE FRAMES FOR DOORS, WINDOWS AND THE LIKE

Marco Fratti, Via Laveno, 6, Milan, and Marco Mattiolo, Via S. Rocco 1, Ceranova, Province of Pavia, both of Italy

Filed Dec. 15, 1986, Ser. No. 941,677

Claims priority, application Italy, Dec. 20, 1985, 23343 A/85; Feb. 20, 1986, 19476 A/86

Int. Cl.[4] E06B *7/12*

U.S. Cl. 52—172 **5 Claims**

1. Casing structure for windows, doors and the like comprising

profiled elements defining a perimetral framework and each having a central body and ends,

an inner edge and an outer edge defined on said central body, -abutment regions defined on said central body and extending between said inner edge and said outer edge,

a recess defined at said inner edge,

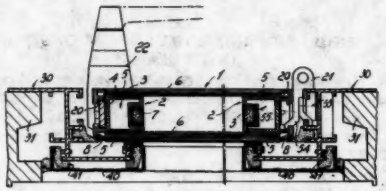
a gel cartridge accommodated in said recess,

two pane -like glass elements,

perimetral regions defined by said pane-like glass elements and engaging with said abutment regions so as to enclose said recess and said gel cartridge between said two pane-like glass elements,

edges defined by said pane-like glass elements,

tabs extending from said outer edge of said central body and engaging said edges of said pane-like glass elements,



a cavity defined in said central body of each of said profiled elements,

connection elements inserted into said cavity from said ends of said profiled elements for connecting said profiled elements together to define said perimetral framework,

wherein said connection elements cause mechanical deformation of said profiled elements upon being inserted into said cavity, and wherein said perimetral regions of said pane-like glass elements are glued to said abutment regions of said central body such that said pane-like glass elements confer mechanical strength to said casing structure.

4,811,533

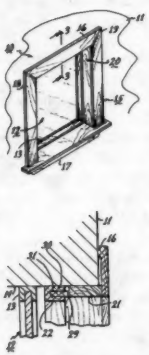
WINDOW TRIM SYSTEM

John L. Wetsel, P.O. Box 8, Diamond Springs, Calif. 95619

Filed Sep. 18, 1987, Ser. No. 98,284

Int. Cl.[4] E06B *1/04*

U.S. Cl. 52—211 **9 Claims**



1. A window trimming construction suitable for use with a metal frame mounted on a wall framing that defines a window opening in a wall, the window trimming construction comprising:

a trim portion having upper and lower horizontal sections and left and right vertical sections that are dimensioned, arranged, and interconnected to cover a portion of a

surface of the wall in a position circumscribing the window opening;

a molding portion having upper and lower horizontal sections and left and right vertical sections that are dimensioned and arranged to cover a portion of the window framing that is disposed intermediate the surface of the wall and the metal frame; and

variable width means for enabling the width of the molding portion to be adjusted according to an amount by which the metal frame is recessed from the surface of the wall;

the variable width means including each of the horizontal and vertical sections of the molding portion including first and second strips joined together adjustably in order to enable the width of the molding portion to be adjusted to generally match the amount the metal frame is recessed from the surface of the wall;

the first strip of each section being attached to a respective one of the horizontal and vertical sections of the trim portion and including a longitudinally extending tongue portion that extends toward the metal frame;

the second strip of each section having a longitudinally extending groove portion in which the tongue portion of the first strip of said section fits adjustably; and

the longitudinally extending groove portion having a width less than the amount the metal frame is recessed from the surface of the wall so that the second strip does not extend out of the window opening beyond the surface of the wall.

4,811,534

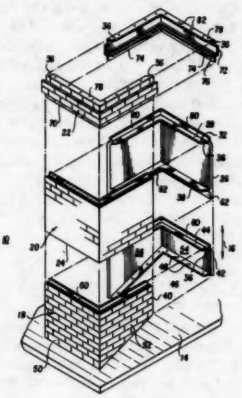
CHIMNEY FACADE SYSTEM

R. Wayne Newsome, P.O. Box 39, Columbia, Md. 21045

Continuation-in-part of Ser. No. 868,090, May 29, 1986, Pat. No. 4,686,807. This application Aug. 5, 1987, Ser. No. 81,804

Int. Cl.[4] E04H *12/28*

U.S. Cl. 52—219 **24 Claims**



1. A pre-fabricated and modular chimney facade system adapted to be secured to an external wall of a building structure, comprising:

(a) a substantially vertically directed chimney stack passing external said building structure and being substantially enclosed by said chimney facade system;

(b) a substantially vertically directed first base housing adapted to be fixedly secured to said external wall of said building structure, said first base housing having an upper substantially horizontally directed flange member extending partially internal said first base housing on one portion thereof for interface securement to another horizontally directed flange member formed on another portion f said first housing; and,

(c) a substantially vertically directed second base housing secured to said first base housing in nested interface therewith.

4,811,535

DOUBLE-WALLED SPECIAL REFUSE DUMP RECEPTACLE

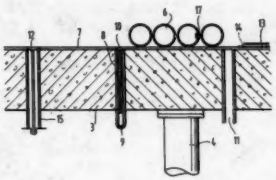
Ernst Rohringer, Steuler Industriewerke GmbH, Hermann-Geisen-Str. 177, D-5410 Hoehr-Grenzhausen, Fed. Rep. of Germany

Filed Apr. 6, 1987, Ser. No. 34,834

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1986, 3611654

Int. Cl.[4] E04B *2/28;* **E04H** *7/26*

U.S. Cl. 52—249 **9 Claims**



1. A receptacle, in particular, for special refuse dumps, which comprises:

an outer wall;

an inner wall at a distance from the outer wall and comprising several adjacent wall elements, with a joint between the adjacent wall elements;

a space between the outer wall and the inner wall; the adjacent wall elements being provided with-.

a tight, chemically stable lining comprising lining sections, each lining section extending outwardly through the joint between adjacent wall elements into said space;

supports for supporting said adjacent wall elements on the outer wall; and

a separable wall of supporting elements placed in front of said lining, said supporting elements comprising a plurality of pipes;

wherein the adjacent wall elements can be moved into the space between the outer wall and the inner wall.

4,811,536

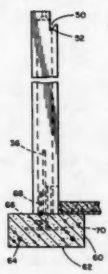
OUTER WALL STRUCTURE FOR BUILDINGS

William G. Hardt, Rte. 4, Box 2270, Lake Geneva, Wis. 53147

Filed Aug. 9, 1982, Ser. No. 406,573

Int. Cl.[4] E04B *1/00*

U.S. Cl. 52—250 **9 Claims**



1. A light weight, high strength monolithic panel of cementitious material, said panel being defined by relatively flat front and back walls in spaced parallel relation, side edges in top and

bottom edges, elongate voids extending continuously through the interior of the panel in closely spaced parallel relation from the bottom edge to a distance short of the top edge, wall rods of inverted U-shape disposed in laterally spaced apart portions of the panel with the bail portion of each wall rod extending through a portion of the panel between adjacent voids and with the arms of the wall rod extending downwardly through the lower portions of the adjacent voids alongside the portion of the panel between said voids.

4,811,537

COMPOSITE WALL FACING CONSTRUCTION WITH APPARENT STONES

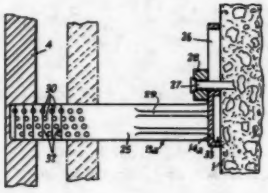
Francois D'Epenoux, Paris, France, assignor to Rocamat, Puteaux, France

Filed Jun. 23, 1986, Ser. No. 877,528

Claims priority, application France, Jun. 24, 1985, 85 09573; Jul. 15, 1985, 85 10820

Int. Cl.[4] E04F *13/08*

U.S. Cl. 52—385 **22 Claims**



1. A composite wall facing construction with apparent stones made of facing plates each comprising a stone slab fixed to a core made of an insulating material, the stone slab being formed with at least two holes in its side for receiving retention studs connected to a wall, the facing plates being stacked onto each other, guided and supported in position by the cores with the stone slabs having their edges spaced from edges of adjacent stone slabs, and a mortar joint being packed between the spaced edges of the stone slabs so that compression forces due to weight of the stone slabs is transmitted by said mortar joint, the core comprising corresponding female and male fitting formations as well as complementary side rabbets.

4,811,538

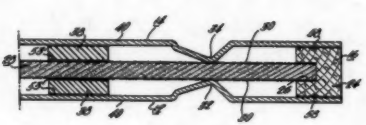
FIRE-RESISTANT DOOR

Charles W. Lehnert, Stone Mountain, and George F. Fowler, Jr., Norcross, both of Ga., assignors to Georgia-Pacific Corporation, Atlanta, Ga.

Filed Oct. 20, 1987, Ser. No. 110,321

Int. Cl.[4] E06B *3/70*

U.S. Cl. 52—455 **23 Claims**



1. A fire-resistant door comprising:

a core panel of mineral material, said core panel including a fiber mat coextensive with and at least partially embedded in each face of said panel,

an edge banding assembly disposed around the periphery of said core panel,

a door facing sheet affixed to each side of said edge banding assembly in spaced parallel relation to said core panel, and a spacer material at least partially filling the spaces between said facing sheets and said core panel.

4,811,539

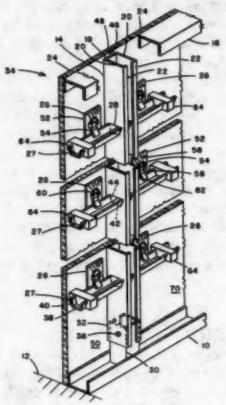
WALL FRAMING SYSTEM

Robert J. Menchetti, Buffalo, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Filed Nov. 2, 1987, Ser. No. 115,946

Int. Cl.[4] E04B *5/52*

U.S. Cl. 52—486 **20 Claims**



1. A wall framing system comprising a plurality of vertical metal studs, a plurality of short channels, and means for mounting wallboard on said short channels, said studs each having at least two web portions in spaced apart relationship, said webs each having openings, said openings in said webs being aligned with openings in a spaced apart web portion, said aligned openings in each said stud being shaped to receive and firmly hold one of said short channels with said channel protruding from said stud a sufficient distance to receive and retain at least one of said wallboard mounting means but not a sufficient distance to reach an adjacent stud, whereby said channel stability is provided by the extending of said short channel through two spaced apart openings.

4,811,540

FIBER REINFORCED SHELL STRUCTURE OF SYNTHETIC MATERIAL

Guenter Kallies, and Dieter Scheidemann, both of Hamburg, Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 27, 1987, Ser. No. 43,082

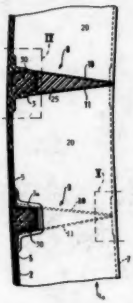
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1986, 3614618

Int. Cl.[4] E04C *2/38*; B64C *1/06*; B32B *3/20*

U.S. Cl. 52—630 **8 Claims**

1. A fiber reinforced shell structure, comprising longitudinal stringers and ribs interconnecting said stringers to form a skeleton, each of said stringers having a channel shape including lateral flanges along each edge of said channel shape and a hard foam insert in said channel shape, a laminated outer skin covering said skeleton including said lateral flanges, said ribs including an outer chord, an inner chord, and rib web means interconnecting said inner and outer chords to form a rib, and rib bracing means (8,9) for bracing said ribs, said rib bracing means being located on both sides of said rib web means, said rib bracing means being connected to said longitudinal stringers, said rib web means comprising a plurality of rib web segments (20, 21), each rib web segment having a main portion

with a flat back and an end portion (10, 11) at each end of said main portion, said end portions of said rib web segments extending away from said flat back, said rib web segments being arranged in two groups so that the end portions of one group of rib web segments point in one direction and the end portions of the other group of rib web segments point in an opposite direction, said rib web segments being positioned in a back-to-



back arrangement and so that the rib web segments (20) of one group are displaced relative to the rib web segments (21) of the other group, whereby said end portions (10, 11) of one group of rib web segments are staggered relative to the end portions of the other group of rib web segments, said web end portions forming said rib bracing means (8, 9) which taper away from said outer skin covering.

4,811,541

THREADED BAR

Ulrich Finsterwalder, Pagodenburgstr. 8, 8000 Munich 60, Fed. Rep. of Germany

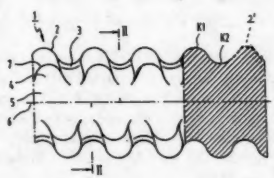
PCT No. PCT/DE86/00207, § 371 Date Mar. 9, 1987, § 102(e) Date Mar. 9, 1987, PCT Pub. No. WO86/06777, PCT Pub. Date Nov. 20, 1986

PCT Filed May 15, 1986, Ser. No. 40,783

Claims priority, application Fed. Rep. of Germany, May 15, 1985, 3517638

Int. Cl.[4] E04C *5/03*; E01D *11/00*

U.S. Cl. 52—737 **5 Claims**



1. In a ribbed bar, especially a tensioning bar, having hot-rolled, helically running ribs situated on two opposite sides of the bar periphery defining an interrupted thread configuration, said ribs extending in full height only over one third of the circumference of the bar and having end surfaces converting tangentially into a smooth side core surface of the bar, whereby the periphery of the bar between the end surfaces of the ribs on opposite sides of the bar defines an arc of a circle, thereby defining a circular core cross-section, the improvement comprising:

said bar having, in a longitudinal section in an axial plane through the region of said ribs, a regular and smooth sinusoidal undulation (K1, K2) corresponding to the outer periphery of the ribs and to the troughs therebetween with smooth transition between adjacent troughs and ribs, wherein the troughs between the ribs form depressions in the circular core cross-section of the bar, the lowest point of the depressions being in the longitudinal symmetrical plane of the bar containing the center of the ribs, thereby acting as pressure regions during a hot-rolling process to uniformly and completely form the ribs, wherein a rib is located radially opposite each depression, each said depression converts, on its outer edges near the end surfaces of the ribs, into said core cross-section and the cross sectional area of the bar is substantially constant over the length of the bar.

4,811,542

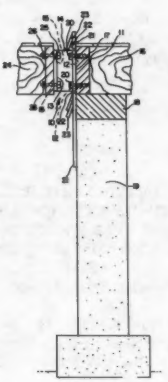
DECK BRACKET AND METHOD OF ATTACHING A DECK TO A BUILDING

Ricky S. Jewell, R.F.D. #2, Box 4985, Mechanic Falls, Me. 04256

Filed Dec. 31, 1987, Ser. No. 139,968

Int. Cl.[4] E04C *3/30*; E04B *1/00*

U.S. Cl. 52—741 **6 Claims**



1. A method of affixing a deck to a building whereby moisture cannot accumulate between said deck and said building, comprising the steps of mounting a deck bracket to said building, said deck bracket comprising; a wide flange; said wide flange having means at its ends adapted to be mounted to said building therethrough; a narrow flange; said narrow flange havng means at its ends adapted to be mounted to said deck therethrough; a web; and said wide flange and said narrow flange spaced apart by said web, caulking said deck bracket at said building, mounting said deck to said narrow flange, and supporting said deck away from said building.

4,811,543

PROCESS FOR INSTALLING PLASTIC PIPES IN A PLASTER FLOOR LAYER

Donald Herbst, Marienplatz 11, 1000 Berlin 45, Fed. Rep. of Germany

Filed Mar. 11, 1986, Ser. No. 839,211

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1985, 3509264

Int. Cl.[4] E04G *21/00*

U.S. Cl. 52—741 **11 Claims**

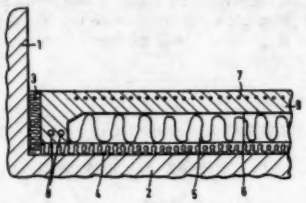
1. A process for installation of plastic pipes through which a medium flows in a plaster layer completely surrounding the pipes, comprising the steps of:

laying the pipes on a substrate;

producing a given pressure in the pipes, enabling the pipes, in a dimensionally stable manner, to withstand external pressures up to a certain level; and

subsequently applying plaster to the pipes, said applying step including the steps of:

initially applying a first plaster layer to the pipes with a consistency such that the pipes float on the first plaster layer and partly project therefrom;



allowing a predetermined setting and therefore fixing the pipes in the first plaster layer; and

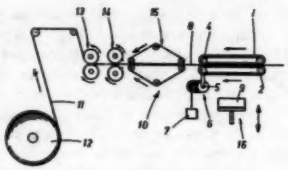
subsequently applying a second plaster layer to the first plaster layer so that the first and second plaster layers form a homogenous connection with one another.

4,811,544

FEED APPARATUS FOR STRIP WRAPPING MATERIAL, USED IN CONJUNCTION WITH A WRAPPING MACHINE OF THE TYPE WHEREIN THE COMMODITY TO BE ENVELOPED IMPINGES ON THE WRAPPING SHEET

Andrea Ciaotti, Bologna, Italy, assignor to Wrapmatic S.p.A., Bologna, Italy

Filed Nov. 10, 1987, Ser. No. 119,146
Claims priority, application Italy, Nov. 11, 1986, 3570 A/86
Int. Cl.[4] B65B 41/02
U.S. Cl. 53—64 5 Claims



1. A feed apparatus for strip wrapping material, used in conjunction with a wrapping machine of the type wherein the commodity to be enveloped impinges on the wrapping sheet, comprising:

a pair of breasted power driven belts located along each longitudinal edge of the wrapping material, the breasted faces of which exhibit sets of transverse teeth offset one from the other in such way as to lie mutually interjacent, each tooth penetrating the space between two teeth of the opposite belt;

at least one motor, the output shaft of which is coupled mechanically to and drives the pulleys about which the belts are looped; and

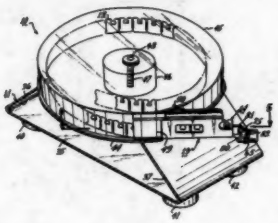
monitoring and control means, to which operation of the motor is interlocked, serving to stop the drive for a given interval each time the belts have been indexed through a set distance corresponding to the length of a discrete sheet of wrapping material, in order to enable faultless interception of the sheet by the commodity to be wrapped.

4,811,545

TAG DISPENSING APPARATUS

Jack Oxman, Newport Beach, Calif., assignor to World Manufacturing, Inc., Costa Mesa, Calif.

Filed Jan. 27, 1987, Ser. No. 6,902
Int. Cl.[4] B65B 61/06
U.S. Cl. 53—138 A 15 Claims



1. An apparatus for dispensing closure tags, comprising:

a support structure adapted to support a strip of interconnected closure tags, each one of which tags has a pair of oppositely disposed first and second edges separated by a tag height, an opening accessible through the first edge into which to insert a bag to be closed, a pair of oppositely disposed forward and rearward edges separated by a tag width, the rearward edge of which is attached breakably to the forward edge of an adjacent tag in the strip of closure tags, and a pair of oppositely facing sides separated by a tag thickness;

a channel member mounted on the support structure through which to feed the strip of closure tags, the channel member defining a pair of first and second generally parallel, elongated channels adapted to slidably receive respective ones of the first and second edges of the tags and thereby guide the strip of closure tags for dispensing purposes;

a forward end portion of the channel member defining a forward end of the second channel that is disposed slightly ahead of a forward end of the first channel, to enable placement of a bag into the opening in the first one of the strip of closure tags while a substantial portion of the lower edge of the first tag is still disposed within the second channel;

a generally rigid guide member attached to the channel member to define a surface disposed generally ahead of and facing the second channel; and

first means, including a first portion of the surface on the guide member that extends from a first position that is generally directly ahead of the forward end of the second channel a distance slightly less than the tag width to a second position that is disposed sideways from the longitudinal axis of the second channel, for guiding the forward edge of the first tag sideways as the first tag is pulled from the channel member and for thereby causing the first tag to bend sideways slightly before being pulled completely from the second channel so that the first tag tends to fold slightly where it is attached to the forward edge of the adjacent tag when the first tag is pulled completely from the second channel.

4,811,546

FILM CASSETTE OPENER FOR UNLOADING A FILM FROM A FILM CASSETTE AND FOR LOADING A FILM IN THE FILM CASSETTE

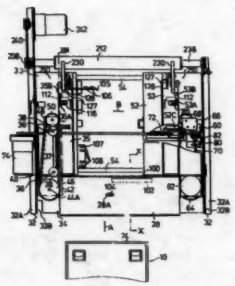
Yutaka Takashima; Mikio Tsuyuki, and Izumi Seto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 10, 1988, Ser. No. 166,598

Claims priority, application Japan, Mar. 11, 1987, 62-55502; Mar. 11, 1987, 62-55505; Mar. 23, 1987, 62-68529; May 8, 1987, 62-112102

Int. Cl.[4] B65B 5/10, 43/38; B65G 65/04

U.S. Cl. 53—266 R 21 Claims



1. A film cassette opener for opening a film cassette for accommodation of a film, to unload said film from said film cassette and/or to load said film in said film cassette, comprising:

a first elongated member disposed parallel to a path along which said film cassette is allowed to move within said film cassette opener, said first elongated member being brought into contact with one side of said film cassette when said film cassette is placed on said path;

a second elongated member disposed parallel to said path and spaced from said first elongated member in parallel with each other, said second elongated member being brought into contact with the other side of said film cassette opposite to said one side;

holding means for causing at least one of said first elongated member and said second elongated member to move toward and away from the other of the same, thereby causing said first elongated member and said second elongated member to hold said film cassette therebetween;

pressing means for pressing at least one of said first elongated member and said second elongated member which hold said film cassette therebetween in the direction in which said one is made to approach the other of said first and second elongated members; and

first driving means for causing movement of said first elongated member and said second elongated member which hold said film cassette therebetween so as to cause said film cassette to move along said path.

4,811,547

DEVICE FOR LOADING AND UNLOADING X-RAY FILM CASSETTES

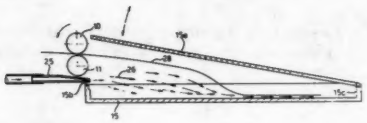
Herman Raats, Wilryk; Manfred Schmidt, Kirchheim, and Johann Zanner, Unterhaching, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Feb. 3, 1988, Ser. No. 152,021

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1987, 3704260

Int. Cl.[4] B65B 5/10, 43/38; B65G 65/04

U.S. Cl. 53—266 R 8 Claims



1. A device for loading and unloading X-ray film cassettes with films, the device comprising means defining a compartment for receiving a cassette; transport means for moving the cassette into and out of said compartment, said means defining a compartment including an insertion opening; means for light-tight closing said opening; means for opening a cassette having a liftable lid and a bottom portion; means for removing a film from the cassette and means for inserting a new film into the cassette; means for determining a cassette format; means for positioning the cassette in said compartment including means for displacement of said cassette in a direction transversal to a direction of the insertion thereof; an electronic control device; and at least one nozzle positioned at said means for inserting a new film and connected to and switchable by said control device so that said nozzle generates during the insertion of the new film into the cassette an air cushion between the film being inserted and a bottom wall of the cassette.

4,811,548

METHOD OF, AND APPARATUS FOR, FABRICATION OF PORTABLE TUBULAR-SHAPED PACKAGES FORMED OF PRINTED PRODUCTS, SUCH AS NEWSPAPERS, PERIODICALS, AND THE LIKE AND PORTABLE PACKAGE PRODUCED ACCORDING TO THE METHOD

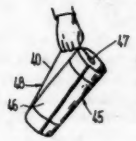
Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Apr. 30, 1987, Ser. No. 49,586

Claims priority, application Switzerland, May 2, 1986, 1815/86

Int. Cl.[4] B65B 25/24, 61/14

U.S. Cl. 53—409 23 Claims



1. A method for fabricating portable, substantially tubular-shaped packages from printed products, such as newspapers, periodicals and the like, comprising the steps of:

winding up into a package roll printed products infed in an imbricated formation, with the thus formed package roll having a hollow interior and an outer surface;

placing a holding element around the package roll in order to retain together said package roll;

guiding an elongate carrying element through the hollow interior of the package roll and along the outer surface of the package roll;

forming from such elongate carrying element an endless carrying loop which extends around the package roll;

interconnecting the ends of the elongate carrying element guided through the hollow interior of the package roll;

guiding the elongate carrying element through a hollow winding core upon which there are wound up the printed products;

withdrawing the formed package roll from the hollow winding core; and

then forming from the carrying element extending through the hollow interior of the package roll the endless carrying loop.

4,811,549

METHOD FOR CONTAINING TWO-PART COMPOSITION

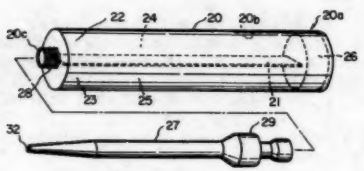
Ikuzo Usami, Negoya; Yoshinori Sato, Sagamihara; Yoshitaka Kurosawa, and Kazuyuki Morimura, both of Hachioji, all of Japan, assignors to Three Bond Co., Ltd., Tokyo, Japan

Filed Apr. 9, 1987, Ser. No. 36,238

Claims priority, application Japan, Apr. 15, 1986, 61-86857; Mar. 2, 1987, 62-30300[U]; Mar. 11, 1987, 62-35373[U]

Int. Cl.[4] B65B *29/10*

U.S. Cl. 53—428 **7 Claims**



1. A method for storing and then mixing, using a cartridge container adapted to contain two jellied components of a two-part composition, comprising

a cylindrical body,

a mixing nozzle communicating with the interior of said body at one end of said body,

an urging lid adapted to be movably inserted in another end of said body, the method comprising the steps of

sliding an isolating membrane into said body separating the interior into two spaces communicating with the nozzle,

isolating the jellied components of the two-part composition contained respectively in said spaces, separately preserving the two components being without being mixed in the body by the isolating membrane,

removing the isolating membrane from the container body, and

mixing said two components by providing at least one blade in said mixing nozzle for promoting mixing of said two components while the latter pass through said nozzle by moving said urging lid into said body.

4,811,550

METHOD AND DEVICE FOR MANUFACTURING AND POSITIONING UPON A CONTAINER AN UNDERCUT THERMOPLASTIC LID, AND CONTAINER PROVIDED WITH SUCH A LID

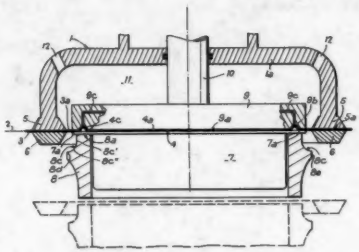
Jean-Claude Hautemont, Gif-Sur-Yvette, France, assignor to Erca Holding, Les Ulis, France

Filed Jun. 29, 1987, Ser. No. 66,980

Claims priority, application France, Jul. 2, 1986, 86 09631

Int. Cl.[4] B65B *7/28, 51/10*

U.S. Cl. 53—478 **14 Claims**



1. Method for manufacturing and positioning an undercut plastic lid made from a thermoplastic band upon a container, comprising the steps of:

(a) applying a heated thermoplastic band against the lower edge of a forming bell with a holding clamp;

(b) locating a container in a support, said container overhanging the upper portion of said support;

(c) positioning the container and support beneath the part of the band delimited by the bell, and moving the container and support upwardly until the upper part of the support and the upper part of the container penetrate inside the bell, thereby stretching the heated band, the support cooperating with the bell to substantially close off the bell at the level of the lower face thereof, thus defining a stamping die or male forming mold for the part of the band between the inner lower edge of the bell and the upper container edge; and

(d) creating a gas pressure inside an enclosure defined by the bell and the stretched band, and applying, under said pressure, the part of the band between the inner lower edge of the bell and the upper container edge against the outer face of the upper part of the container and the support.

4,811,551

PACKAGING APPARATUS FOR PACKAGING EGGS, ETC.

Yukio Nambu, Kameoka, Japan, assignor to Nambu Electric Co., Ltd., Kyoto, Japan

PCT No. PCT/JP86/00214, § 371 Date Dec. 12, 1986, § 102(e) Date Dec. 12, 1986, PCT Pub. No. WO86/06304, PCT Pub. Date Nov. 6, 1986

Continuation of Ser. No. 7,968, Dec. 12, 1986, abandoned. This PCT application Apr. 28, 1986, Ser. No. 205,503

Claims priority, application Japan, Apr. 30, 1985, 60-92966

Int. Cl.[4] R65B *57/14, 57/20, 23/06*

U.S. Cl. 53—500 **7 Claims**

1. A packaging apparatus comprising:

means for successively conveying objects to be packed,

means for successively detecting a physical characteristic of each object to be packed which is conveyed by said conveyor means,

means connected to said detecting means for sorting out said conveyed objects according to a difference of the physical characteristic,

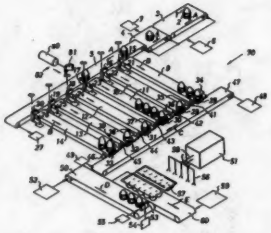
a plurality of means for separately accumulating the thus

sorted-out objects according to the difference of the physical characteristic,

forming means for successively taking out from the respective accumulating means the objects by numbers predetermined with respect to the respective accumulating means said predetermined numbers being variably set so that objects belonging to the respective physical characteristics are combined in a desired ratio in one unit of a packaging container, while maintaining total of the thus combined objects at a predetermined number of pieces of the objects which are to be packed into said one unit of the packaging container, and for forming a set of a predetermined number of pieces of said objects,

means for placing said set of objects formed by said forming means into said packaging container,

said sorting mean comprises a first conveyor for receiving the objects successively conveyed from the detecting means, and a plurality of devices for respectively cross-transferring the objects on the first conveyor in a direction crossing a direction of conveyance of the first conveyor according to the difference of physical characteristic of



the objects, said cross-transferring devices being spaced apart from each other along the direction of conveyance of the first conveyor,

said plurality of accumulating means comprise a plurality of conveyors positioned at their one ends on one side of the first conveyor so as to associate with respective cross-transferring devices and extending in the direction crossing the direction of conveyance of the first conveyor, and a plurality of gate devices, each of which is disposed at the other end of each of the plurality of conveyors, said gate devices being adapted to prevent the respective objects on the plurality of conveyors from being conveyed beyond the other ends so as to accumulate the objects cross-transferred by the respective cross-transferring devices on each of the plurality of conveyors,

said forming means comprises a second conveyor disposed along the respective other ends of said plurality of conveyors and a device for opening the respective gate devices so as to be able to respectively take out from the respective accumulating means the objects by the number predetermined with respect to the respective accumulating means.

4,811,552

PROPELLING DRIVE TRANSMISSION STRUCTURE FOR WALKING OPERATOR TYPE LAWN MOWER

Satoshi Fujimoto, Sakai, Japan, assignor to Kubota Ltd., Osaka, Japan

Filed Nov. 9, 1987, Ser. No. 118,688

Claims priority, application Japan, Nov. 10, 1986, 61-267180; Dec. 16, 1986, 61-193831[U]; Dec. 17, 1986, 61-194688[U]

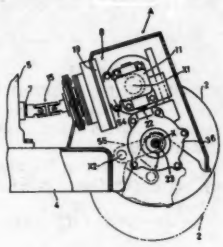
Int. Cl.[4] A01D *34/74*

U.S. Cl. 56—11.8 **4 Claims**

1. A propelling drive transmission structure for a walking operator type lawn mower having a cutting blade on a blade axis substantially centrally longitudinally of the mower, cutting blade housing means for housing the cutting blade, and an engine mounted above the cuting blade housing means and having a power output, the propelling drive transmission structure comprising:

(a) drive wheel means including:

an axle mounted rearwardly of the cutting blade and having a power input section, the axle being vertically pivotable for adjusting the height of the mower from the ground and laterally pivotable about a pivot point located substantially in the transverse center of the mower, and



wheels mounted on opposite ends of the axle,

(b) a change speed mechanism for changing the speed of the power output from the engine and transmitting the changed speed power output to a power output section thereof, the change speed mechanism being fixed to the mower above said axle at a higher position than the cutting blade housing means, and

(c) rotary shaft means comprising a telescope structure, the rotary shaft means being operatively connected between said power output section and the power input section of the drive wheel means to vary a space therebetween.

4,811,553

ROTARY MOWER IN WHICH THE ROTARY CUTTING ELEMENTS ARE DRIVEN BY TRANSMISSION MEANS LOCATED UNDER THE ROTARY CUTTING ELEMENTS

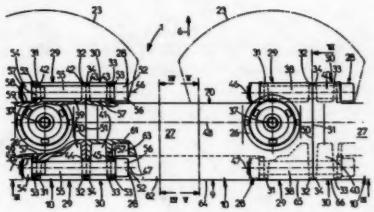
Rino Ermacora, and Horst Neuerburg, both of Saverne, France, assignors to Kuhn, S.A., Saverne, France

Continuation of Ser. No. 19,672, Feb. 27, 1987, Pat. No. 4,763,463. This application Feb. 3, 1988, Ser. No. 152,041

Claims priority, application France, Feb. 27, 1985, 86 02899

Int. Cl.[4] A01D *34/66*

U.S. Cl. 56—13.6 **25 Claims**



1. A mower comprising:

(a) a plurality of rotary cutting elements each one of which is provided with at least one cutting tool;

(b) at least one of said plurality of rotary cutting elements being driven by transmission means housed in a housing located under said plurality of rotary cutting elements;

(c) said housing comprising modules in which said rotary cutting elements are guided in rotation;

(d) said modules comprising each a body and two flanges, a first flange extending at a first end portion of the corresponding module and a second flange extending at a second end portion of the corresponding module, said flanges permit to connect said modules to one another by means of assembly elements passing through said flanges;

(e) said flanges being each at least partially formed by at least two wings spaced from one another in a longitudinal direction of said housing and directed crosswise to a longitudinal axis of said housing; and

(f) said wings being connected together by at least one connecting wing directed crosswise in relation to a working direction and connected to the body of the associated module.

4,811,554

FRICTION SPINNING APPARATUS

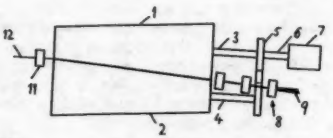
Alfred Wood, Greater Manchester, and Robert Lane, Accrington, both of England, assignors to Hollingsworth (U.K.) Ltd., Accrington, United Kingdom

Filed Jan. 29, 1988, Ser. No. 150,116

Claims priority, application United Kingdom, Feb. 6, 1987, 8702723

Int. Cl.[4] D01H *1/12, 1/135*

U.S. Cl. 57—401 **17 Claims**



1. In friction spinning apparatus including:

(a) first and second rotatable bodies arranged side-by-side so as to have a line of closest approach with first and second ends, said first rotatable body being conical and having a narrower first end and a wider second end, said first end of said line of closest approach being adjacent said first end of said first rotatable body;

(b) means for feeding fibres to said line of closest approach adjacent the first end of said line of closest approach; and

(b) means adjacent said second end of said line of closest approach for withdrawing spun yarn from said line of closest approach;

the improvement wherein there are no means for feeding an end of a spun yarn back onto the line of closest approach from said other end for piecing purposes.

4,811,555

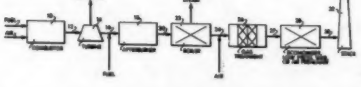
LOW NOX COGENERATION PROCESS

Ronald B. Bell, Austin, Tex., assignor to Radian Corporation, Austin, Tex.

Filed Nov. 18, 1987, Ser. No. 122,067

Int. Cl.[4] F02C *6/18*

U.S. Cl. 60—39.06 **14 Claims**



1. A process for low NOX cogeneration to produce electricity and heat which comprises combusting fuel to produce a gaseous stream of combustion products, passing said gaseous stream through a turbine to generate electricity, and to produce a gaseous exhaust stream, adding additional fuel to said exhaust stream, to provide a combustible gas stream having fuel in excess of the oxygen in said combustible gas stream, combusting said combustible gas stream in a reducing atmosphere to produce a heated oxygen-depleted gaseous stream, converting at least a portion of the heat in said oxygen-depleted stream into steam, adding air to said oxygen-depleted stream to produce a stoichiometric excess of oxygen in the resultant stream relative to fuel present in said resultant stream, passing said resultant stream over an oxidizing catalyst to produce an oxidized gaseous stream, removing heat from said oxidized stream, and venting the resultant cooled stream.

4,811,556

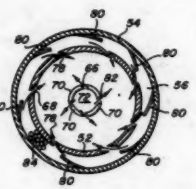
MULTIPLE-PROPELLANT AIR VEHICLE AND PROPULSION SYSTEM

Monica M. Lau, Oceana, and George A. Coffinberry, West Chester, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 14, 1986, Ser. No. 918,215

Int. Cl.[4] C06D *5/00*

U.S. Cl. 60—206 **23 Claims**



1. A propulsion system which utilizes hydrocarbon and hydrogen fuel, comprising:

(a) a rocket casing having a combustor liner and a throat liner;

(b) a fuel passageway for the hydrocarbon and hydrogen fuel adjacent to and surrounding the combustor liner and the throat liner;

(c) means for providing fuel flow in the fuel passageway;

(d) means for providing high heat flux to the combustor liner and throat liner from combustion within the rocket casing whereby the temperature of the liners would exceed their thermal limits if not cooled; and

(e) means for cooling of the combustor liner and throat liner by endothermic pyrolysis of the hydrocarbon in the presence of hydrogen in the fuel passageway, whereby the hydrogen in the fuel accelerates the rate of endothermic pyrolysis.

4,811,557

DOUBLE AIR-FUEL RATIO SENSOR SYSTEM HAVING IMPROVED EXHAUST EMISSION CHARACTERISTICS

Atsuo Okumura, Toyota, and Takayuki Demura, Mishima, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Oct. 8, 1987, Ser. No. 105,707

Claims priority, application Japan, Oct. 13, 1986, 61-241485

Int. Cl.[4] F02D *41/14*

U.S. Cl. 60—274 **6 Claims**

1. A method for controlling an air-fuel ratio in an internal combustion engine having a catalyst converter for removing pollutants in the exhaust gas thereof, and upstream-side and downstream-side air-fuel ratio sensors disposed upstream and downstream, respectively, of said catalyst converter, for detecting a concentration of a specific component in the exhaust gas, comprising the steps of:

calculating an air-fuel ratio correction amount in accordance with the outputs of said upstream-side and downstream-side air-fuel ratio sensors;

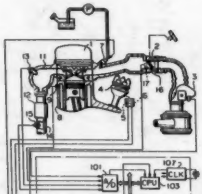
increasing a speed of renewal of said air-fuel ratio correction amount when the output of said downstream-side air-fuel ratio sensor indicates a lean state to a speed higher than when the output of said downstream-side air-fuel ratio sensor indicates a rich state; and

adjusting an actual air-fuel ratio in accordance with said air fuel ratio correction amount;

wherein said air-fuel ratio correction amount calculating step comprises the steps of:

calculating an air-fuel ratio feedback control parameter in accordance with the output of said downstream-side air-fuel ratio sensor; and

calculating said air-fuel ratio correction amount in accordance with the output of said upstream-side air-fuel ratio sensor and said air-fuel ratio feedback control parameter;



said increasing step increasing the speed of renewal of said air-fuel ratio feedback control parameter when the output of said downstream-side air-fuel ratio sensor indicates a lean state to a speed higher than when the output of said downstream-side air-fuel ratio sensor indicates a rich state; and

wherein said air-fuel ratio feedback control parameter is defined by a lean skip amount by which said air-fuel ratio correction amount is skipped down when the output of said upstream-side air-fuel ratio sensor is switched from the lean side to the rich side and a rich skip amount by which said air-fuel ratio correction amount is skipped up when the output of said downstream-side air-fuel ratio sensor is switched from the rich side to the lean side.

4,811,558

SYSTEM AND METHOD FOR PROVIDING COMPRESSED GAS

Benton F. Baugh, P. O. Box 42888, Houston, Tex. 77042

Filed Oct. 13, 1981, Ser. No. 310,900

Int. Cl.[4] F04B *23/06*; F01N *5/00*

U.S. Cl. 60—281 **41 Claims**

1. A gas recovery system comprising:

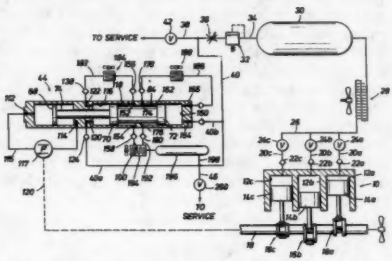
an internal combustion engine having at least one combustion chamber and a drive piston movable therein;

extraction outlet means adapted for extracting compressed exhaust gas from said combustion chamber independently of the movements of said drive piston and subsequent to firing in said combustion chamber;

collection vessel communicatively connected to said combustion chamber by said extraction outlet means;

and means for preventing extraction of said gas from said combustion chamber through said extraction outlet means during recharging and compression therein and further preventing extraction of the entirety of such exhaust gas through said extraction outlet means comprising

means for maintaining said collection vessel under pressure, and check valve means in said extraction outlet means operative by pressure in said combustion chamber exceeding the pressure in said collection vessel to open and permit flow from said combustion chamber to said collection vessel and and by pressure in said collection vessel exceeding the pressure in said combustion chamber to close and prevent flow from said collection vessel to said combustion chamber.



4,811,559

APPARATUS FOR REMOVING SOOT FROM THE EXHAUST GASES OF AN INTERNAL COMBUSTION ENGINE

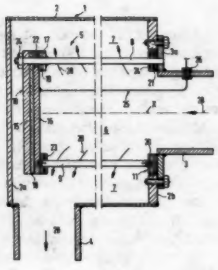
Dietmar Henkel, Neumarkt, Fed. Rep. of Germany, assignor to Man Nutzfahrzeuge GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 3, 1987, Ser. No. 116,618

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 3637331

Int. Cl.[4] F01N *3/02*

U.S. Cl. 60—303 **12 Claims**



1. In an apparatus for removing soot from the exhaust gases of an internal combustion engine, especially a Diesel engine, said apparatus including a metallic housing with inlet and outlet connectors for the exhaust gas flow, and a filter insert that is disposed in the housing and contains a non-metallic, high-temperature resistant filter means in the form of a wrap structure mounted on a support member, with said filter insert, in said filter housing, separating an untreated-gas chamber from a clean-gas chamber, and with an electric current source being used to burn off, in a controlled manner, the soot deposited on said filter means whereby the soot itself serves as an electrical heat conductor, for which purpose said filter insert is provided with an appropriate electrode configuration having electrodes, the improvement therewith wherein:

to form said filter means, said support member is in the form of a wrapped cage that has a central axis and that is provided with said wrap structure and also provides said electrode configuration having the electrodes, with untwisted roving threads having individual fibers being used

that are wound on said cage parallel to the circumference thereof, i.e. that extend perpendicular to the central axis of said cage, to form said wrap structure of said wrapped cage, said roving threads being wound tightly so that a very high degree of soot deposition occurs in capillary gaps that are oriented parallel to individual fibers of the roving and, in addition, there results an electrical conductivity of a layer of soot formed having a preferred direction, namely in the direction of formation of the capillary gaps, i.e. in the peripheral direction of the winding, and, since this direction of the conductivity coincides with the direction of an electrical field present between the electrodes, having a desired effect that even very small quantities of deposited soot form conductive paths that are formed in the manner of threads and can be heated electrically and consequently burned off.

4,811,560
EXHAUST SYSTEM FOR MARINE PROPULSION

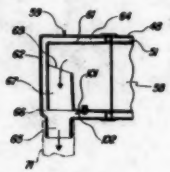
Ryoichi Nakase, and Masayoshi Nanami, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 11, 1987, Ser. No. 96,593

Claims priority, application Japan, Sep. 16, 1986, 61-215698; Sep. 16, 1986, 61-215700; May 7, 1987, 62-109906

Int. Cl.[4] F01N *3/04*

U.S. Cl. 60—310 **29 Claims**



1. An expansion chamber for the exhaust system of an internal combustion engine powering a small watercraft, said expansion chamber being comprised of an outer housing defining a generally horizontally extending expansion chamber, exhaust gas inlet means for delivering exhaust gases into said expansion chamber at one end thereof, said exhaust gas inlet means having an opening into said expansion chamber of lesser dimensions than the cross sectional area of said expansion chamber for the expansion of exhaust gases as they enter into said expansion chamber, exhaust gas outlet means at the other end of said expansion chamber for delivering exhaust gases to the atmosphere, said exhaust gas outlet means extending through a lower wall of said outer housing and upwardly into said expansion chamber and being defined by a vertically extending wall having an inlet opening disposed above the lower surface of said expansion chamber and of smaller area than said cross sectional area of said expansion chamber for reducing the likelihood of water entering said expansion chamber from said exhaust gas outlet means.

4,811,561
POWER TRANSMISSION

Thomas L. Edwards, Almont; Yehia M. El-Ibiary, Troy; Rajamouli Gunda, Rochester; Richard S. Leemhuis, Rochester Hills; Fred H. Phillips, Troy, and Melvin A. Rode, West Bloomfield, all of Mich., assignors to Vickers, Incorporated, Troy, Mich.

Continuation-in-part of Ser. No. 849,542, Apr. 8, 1986, Pat. No. 4,744,218. This application Mar. 7, 1988, Ser. No. 164,958

Int. Cl.[4] F16D *31/00*

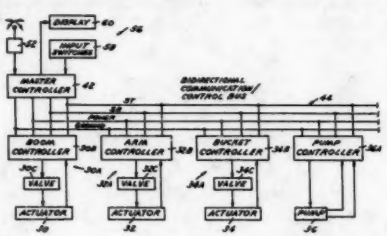
U.S. Cl. 60—368 **10 Claims**

1. An electrohydraulic system with distributed control comprising:

a plurality of electrohydraulic devices responsive to electronic control signals for performing hydraulic operations to obtain motion a. loads coupled to said devices,

control means for providing said control signals and comprising a plurality device control means each associated with and directly controlling motion at an individual said hydraulic device, pseudo-device control means for performing operations common to a multiplicity of said devices, and master control means for coordinating operation among said device and pseudo-device control means, and

a communications bus interconnecting said master, device and pseudo-device control means, each of said device and



pseudo-device control means being constructed for individual communication with said master control means on said bus,

said master control means including means for establishing a repetitive time sequence of communication windows and means for communicating with each of said device and pseudo-device control means in turn during an associated said window,

each said device and pseudo-device control means including means for communicating with said master control means only during an associated said window, and means for performing control operations other than during said associated window.

4,811,562
ADJUSTING DRIVE

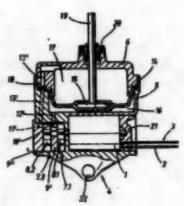
Ruediger Hoffmann, Sindelfingen; Dieter Feichtiger, Aidlingen; Josef Schumacher, Reutlingen; Peter H. Haller, Stuttgart, and Klaus-J. Heimbrodt, Treuchtlingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft; Bornemann & Haller KG and Walter Alfmeier GmbH & Co., all of, Fed. Rep. of Germany

Filed Nov. 3, 1987, Ser. No. 116,156

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 3637404

Int. Cl.[4] F16D *31/02*

U.S. Cl. 60—370 **10 Claims**



1. An adjusting drive, comprising closed housing means, a fluidic system at least partly filled with air in said housing means including within said housing means an electric motor, pump means having chamber means and driven by the electric

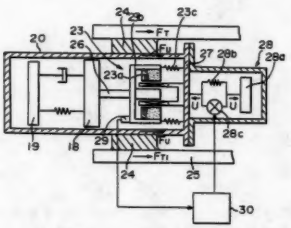
motor, and a piston working element movable within working chamber means by pressure actuation by a fluid conveyed by the pump means through fluid channel means integrated into said housing means, and an adjusting member operatively connected with the piston working element and extended in a pressure-tight manner out of the housing means, said adjusting member being movable to and fro between two end positions together with said piston working element, pressure differences in the fluidic system being automatically equalized after stoppage of the rotation of the pump means, the pump means including two pump rotors, two separate pump chamber means being provided in the housing means, each of said pump rotors being arranged in a respective pump chamber means, a first one of said flow channel means extending from the first pump chamber means by way of a pressure connection to a first working chamber means of the piston working element, a second flow channel means extending from the second pump chamber means by way of a pressure connection to a second working chamber means of the double-acting piston working element, both pump chamber means having each an atmosphere connection which, in relation to the respective pressure connection of the pump chamber means, is arranged on the pressure side of the respective pump rotor disposed opposite to the pressure connection, the pressure connections and the atmosphere connections being arranged in such a manner that one pump rotor supplies air from the atmosphere connection to the pressure connection of its pump chamber means and at the same time the respective other pump rotor supplies air from the pressure connection to the atmosphere connection of its pump chamber means when the electric motor rotates which is reversible in its direction of rotation so that, depending on the rotation of the electric motor, one working chamber means is acted upon with excess pressure and the respective other working chamber means is acted upon at the same time with vacuum.

4,811,563

VIBRATION-REDUCING APPARATUS

Yoshiro Furuishi; Takuya Suganami, and Michio Fujiwara, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1988, Ser. No. 177,396
Claims priority, application Japan, Apr. 20, 1987, 62-98411
Int. Cl.[4] F02G *1/04*
U.S. Cl. 60—517 **5 Claims**



1. A vibration-reducing apparatus for a direct-acting type stirling engine wherein a change of pressure caused by reciprocating movements of a displacer is applied to a power piston to produce a mechanical force, and the mechanical force is converted into an electric power by a direct-acting type electric generator which is directly connected to said power piston so as to effect reciprocating movements with said power piston, which comprises:

a vibration-controlling actuator fixed to a cylinder to produce a vibration-controlling force in response to a drive-controlling signal given by the outside thereof;

a detector for detecting an unbalanced movement by a force of inertia in the reciprocating movements of a direct-driving part consisting of said power piston and said direct-acting type electric generator; and,

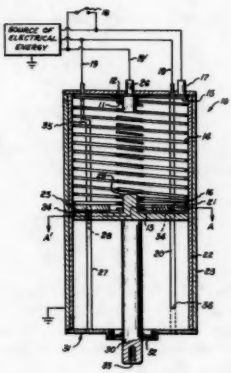
a control circuit for receiving a detection signal from said detector to control said vibration-controlling actuator so that the vibration-controlling force of said vibration-controlling actuator cancels said unbalanced movement by the force of inertia caused by the reciprocating movements of said direct driving part.

4,811,564

DOUBLE ACTION SPRING ACTUATOR

Mark D. Palmer, 45 Calvin St., Rochester, N.Y. 14612

Filed Jan. 11, 1988, Ser. No. 142,550
Int. Cl.[4] F03G *7/06*
U.S. Cl. 60—527 **8 Claims**



1. In a linear double action actuator the improvement which comprises:

a retractor spring constructed of a shape memory metal and an expansion spring constructed of a shape memory metal, each of said springs being attached at one end thereof to one end of an arm movably supported by and within said actuator, each of said springs being attached at their other end to a stationary member formed within said actuator, means for connecting said actuator to a source of energy and means for supplying said energy selectively to one of said springs, whereby the selective amortizations transforms said energized spring from the martensitic state to the austenitic state thereby slidably moving said movable arm in the desired direction within said actuator, said springs being substantially parallel at all times to each other and to the path of travel of said movable arm.

4,811,565

STEAM TURBINE VALVE MANAGEMENT SYSTEM

Edward Y. Hwang, Winter Park, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

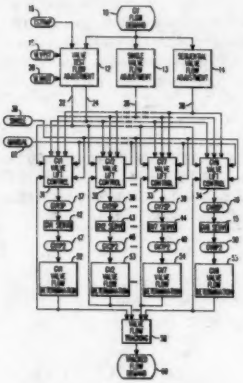
Filed Feb. 5, 1988, Ser. No. 153,301
Int. Cl.[4] F01K *13/02*
U.S. Cl. 60—646 **16 Claims**

1. A method for controlling, in response to a total demand signal, a plurality of inlet valves controlling energy supplied to a power conversion device, said method comprising the steps of:

(a) providing separate sets of adjustment characteristics corresponding to unison and sequential operation modes;

(b) selecting a valve operation mode from among the unison and sequential operation modes and

(c) positioning each of the inlet valves in dependence upon the sets of adjustment characteristics provided in step (a),



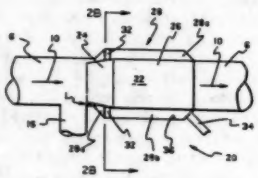
the valve operation mode selected in step (b) and the total demand signal.

4,811,566

METHOD AND APPARATUS FOR REMOVING MOISTURE FROM TURBINE EXHAUST LINES

George J. Silvestri, Jr., Winter Park, and Homer G. Hargrove, Maitland, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 21, 1987, Ser. No. 87,940
Int. Cl.[4] F01K *21/06*
U.S. Cl. 60—646 20 Claims



1. In a high pressure steam turbine having an exhaust chamber including a snout connected by crossunder piping of a first predetermined inside diameter to a moisture separator, wherein a two-phase vortical flow of exhaust steam from the exhaust chamber of the turbine creates a localized area of liquid entrainment within the piping, apparatus for removing the entrained liquid from the area comprising:

tubular means for catching the entrained liquid at the localized area, said tubular means including a diverging inlet portion and a substantially cylindrical outlet portion;

means for housing said tubular means within the piping, said housing means having a second predetermined inside diameter greater than said first predetermined inside diameter thereby creating an annular-shaped collection chamber between said tubular means and said housing means, said collection chamber at said inlet portion of said tubular means being disposed at a point within the piping where the vortical flow substantially loses its effectiveness; and

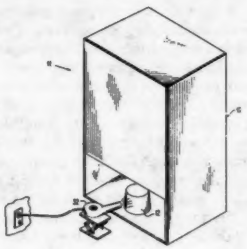
means for draining said collection chamber.

4,811,567

METHOD FOR TESTING THE OPERABILITY OF A REFRIGERANT SYSTEM

Stephen M. Bakanowski, and William H. Mapes, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Mar. 3, 1988, Ser. No. 163,844
Int. Cl.[4] G01M *19/00*
U.S. Cl. 62—129 20 Claims



1. A method for testing, prior to initial operation, the operability of a refrigerant system including a compressor and an evaporator having a plurality of serially connected coils, the method including:

applying heat to the compressor for a predetermined period of time;

determining the temperature of one of the serially connected coils of the evaporator remote from the first of the coils of the evaporator through which refrigerant flows after the compressor is activated for a predetermined period of time;

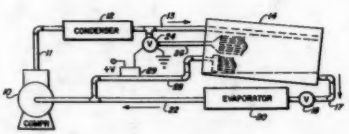
and ascertaining if the determined temperature is within a predetermined range to indicate that the refrigerant system is operable.

4,811,568

REFRIGERATION SUB-COOLER

Thomas R. Horan, and Kyle E. Hart, both of Scottsdale, Ariz., assignors to RAM Dynamics, Inc., Phoenix, Ariz.

Filed Jun. 24, 1988, Ser. No. 210,244
Int. Cl.[4] F25B *41/00*
U.S. Cl. 62—200 26 Claims



1. In a refrigeration system comprising a compressor, a condensor, a sub-cooler, an expansion device, and an evaporator, connected in series in the order named, with the outlet of the compressor connected to the inlet of the condensor, the outlet of which supplies liquid refrigerant to the sub-cooler from which liquid refrigerant is supplied to the expansion device and the evaporator, and with the outlet of the evaporator connected to the inlet of the compressor; an improvement in the sub-cooler including in combination:

an outer housing, having a main inlet coupled to the condensor outlet and a main outlet coupled to the expansion device, and having a second inlet and a second outlet;

a spray bar, having first and second ends of a predetermined length, located within said housing and coupled at said first end to said main inlet to receive refrigerant therefrom, said spray bar having a plurality of apertures therein

for spraying refrigerant therefrom into the interior of said housing;

a plurality of separate cooling coils in said housing, each cooling coil having an inlet end and an outlet end;

distributor means located within said housing;

collector means located within said housing;

said distributor means having an inlet and a plurality of outlets corresponding to said plurality of cooling coils, the inlet of said distributor means coupled with said second inlet and the outlets thereof coupled with the corresponding inlets of said plurality of cooling coils;

said collector means having a plurality of inlets and an outlet, the plurality of inlets thereof coupled with the outlet ends of said plurality of separate cooling coils and the outlet thereof coupled with said second outlet;

expansion valve means coupled with the outlet of the condensor to receive refrigerant therefrom and coupled with said second inlet of said housing for supplying expanded refrigerant thereto; and

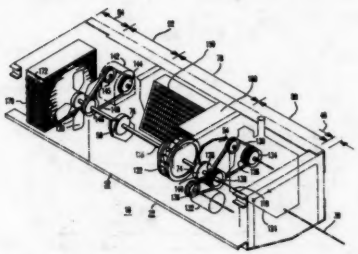
means coupling said second outlet of said outer housing with the inlet of the compressor.

4,811,569

ZERO CUBE TRANSPORT REFRIGERATION UNIT FOR STRAIGHT TRUCKS

Dennis E. Welch, St. Paul, and William L. Waldschmidt, Farmington, both of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed May 23, 1988, Ser. No. 197,177
Int. Cl.[4] B60H *1/32*
U.S. Cl. 62—239 **12 Claims**



1. A zero cube transport refrigeration unit suitable for a straight truck, comprising:

an elongated metallic frame having first and second ends and a longitudinal axis which extends between said ends,

said frame defining laterally spaced prime mover, evaporator, compressor and condenser sections disposed in the recited order from the first to the second end of said frame,

an internal combustion engine in said prime mover section,

an evaporator completely disposed within said evaporator section,

a compressor in said compressor section,

a condenser in said condenser section,

a single power shaft common to all of said sections, extending from the prime mover section to the condenser section, through said evaporator and compressor sections,

air mover means directly mounted on said power shaft,

first belt means coupled between said internal combustion engine and said power shaft, to drive said power shaft,

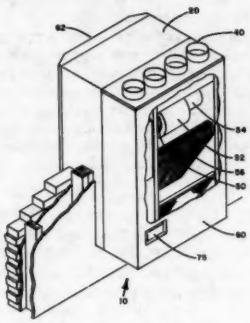
and second belt means coupled between said power shaft and said compressor, to drive said compressor.

4,811,570

SLEEVE ASSEMBLY WITH ATTACHED DUCT AND DRAIN CONNECTIONS FOR A THROUGH THE WALL AIR CONDITIONING UNIT

William B. Jennings, Collierville, Tenn.; John Thompson, Marietta, and Richmond S. Hayes, Jr., Fayetteville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 26, 1982, Ser. No. 401,443
Int. Cl.[4] F25D *23/12*
U.S. Cl. 62—263 **2 Claims**



1. A sleeve assembly for securing an air conditioning unit extending through an opening in an exterior wall of a building, comprising:

a sleeve assembly including a bottom wall, side walls and a top wall all connected to define a unit receiving opening through which the unit may be mounted;

duct connections mounted to a portion of the sleeve assembly, said connections being adapted to be connected to duct work of the building for directing conditioned air within an enclosure and being in registration with a supply of conditioned air from the air conditioning unit such that the duct work may be connected to the sleeve assembly prior to the assembly of the unit into the sleeve assembly; and

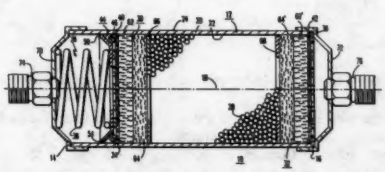
a condensate collection means associated with the bottom wall, said means located relative to the unit when assembled to receive condensate from the unit and including an indentation formed in the bottom wall, said indentation including an opening at the bottom thereof for connection to a drainage conduit.

4,811,571

REFRIGERANT DRIER

Donald K. Mayer, Bloomington, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Mar. 28, 1988, Ser. No. 173,911
Int. Cl.[4] F25B *43/00*
U.S. Cl. 62—474 **11 Claims**



1. A refrigerant drier comprising:

a generally cylindrical, tubular body member having a wall defined by inner and outer surfaces which are symmetrical

about a longitudinal axis, and first and second axial ends adapted for connection in a refrigeration system,

first and second perforated support plates disposed in spaced parallel relation in said body member, transverse to the longitudinal axis of said body member,

said first support plate being axially slidable within said body member, in close proximity to said inner surface,

said second support plate being fixed,

desiccant material in said body member, between said first and second support plates,

spring means urging said slidable first support plate towards said fixed second support plate, to maintain said desiccant material in compression,

and means allowing said slidable first support plate to move axially towards said second support plate in response to urging by said spring means, while preventing movement of said first support plate in the opposite axial direction,

to maintain the desiccant material in compression and reduce the generation of refrigerant contaminating dust caused by the attrition of the desiccant material when vibrated.

4,811,572

CIRCULAR WEFT KNITTING MACHINE

E. C. Tibbals, Jr., Rte. 2, Box 386, High Point, N.C. 27260

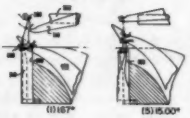
Division of Ser. No. 398,303, Jul. 14, 1982, Pat. No. 4,608,839.

This application Mar. 24, 1986, Ser. No. 810,361

The portion of the term of this patent subsequent to Dec. 8, 2004, has been disclaimed.

Int. Cl.[4] D04B *15/24*

U.S. Cl. 66—13 **10 Claims**



1. In the circular weft knitting of articles employing a compound needle assembly that includes a displaceable needle element having a hooked end and an independently displaceable closing element therefore, the steps of

initiating the drawing of a stitch by yarn engagement intermediate the hooked end of said needle element during downward needle element displacement and an elevated first land on an upwardly moving sinker element and

radially displacing said upwardly moving sinker element to transfer the locus of yarn engagement from said first land to an adjacent second land thereon prior to termination of said downward displacement of said needle element to draw a stitch of predetermined length.

4,811,573

TWO FACE STITCH BONDED FABRIC

Herschel Sternlieb, Brunswick, Me., assignor to W.S. Libbey Co., Lewiston, Me.

Continuation of Ser. No. 882,094, Jul. 3, 1986, abandoned. This application Dec. 2, 1987, Ser. No. 127,588

Int. Cl.[4] D04B *23/10*

U.S. Cl. 66—193 **4 Claims**

1. A decorative fabric made on two stitch through type machines of different gauge, such as Malimo Machines, said fabric comprising:

a non-woven, flexible substrate having a front face and a rear face;

a first plurality of spaced yarns laid on the front face of said substrate in the filling direction;

first knitting threads of predetermined gauge forming a series of warpwise loop chains which bind only said first filling yarns and said substrate into an integral structure;

a second plurality of spaced yarns laid on the rear face of said substrate in the filling direction; and

second knitting threads, of predetermined gauge different from the predetermined gauge of said first knitting threads forming a series of warpwise loop chains which bind only

said second plurality of spaced yarns and said substrate into said integral structure.

4,811,574

APPARATUS FOR FLOW-THROUGH TREATMENT OF TEXTILE MATERIAL, PAPER, OR THE LIKE

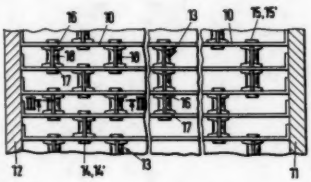
Gerold Fleissner, Chur, Switzerland, assignor to Fleissner Maschinenfabrik AG, Rebstein, Switzerland

Filed Jun. 9, 1988, Ser. No. 204,289

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1988, 3802791

Int. Cl.[4] D06B *3/02*

U.S. Cl. 68—5 D **12 Claims**



1. An apparatus for the flow-through treatment of textile material, nonwovens, or paper, with a gaseous or liquid treatment medium circulated in the entire apparatus, comprising a permeable drum subjected to throughflow from the outside toward the inside, said drum being under a suction draft and having end plates at end faces and serving as a conveying element, said drum being covered on its periphery with a screen-type cover, sheet metal strips extending in the axial direction of the drum and being arranged between the end plates of the drum, an extension in width of said sheet metal strips extending substantially in the radial direction, and a plurality of connecting elements connecting the sheet metal strips being arranged in the peripheral direction between the sheet metal strips:

(a) said connecting elements each being a one-piece element,

(b) said connecting elements each have a width corresponding to a desired spacing of the directly adjacent sheet metal strips, and

(c) said connecting elements are firmly connected on both sides with an adjoining sheet metal strip.

4,811,575

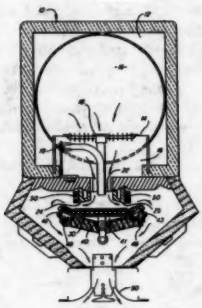
SOUND INSULATED BELLOWS-TYPE AIR TERMINAL VALVE

Frederick A. Carrier, Syracuse, and Carl C. Herb, Camillus, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Continuation-in-part of Ser. No. 562,547, Dec. 19, 1983. This application Oct. 13, 1987, Ser. No. 107,608

Int. Cl.[4] F24F *13/08*

U.S. Cl. 98—41.1 4 Claims



1. An air terminal means comprising:

an elongated slot means which is fluidly connected to a plenum and which defines an outlet having cutoff plates extending laterally from both sides of said elongated slot to define a seating surface having a predetermined width;

discharge means for discharging air flowing through said slot into a zone;

bellows retainer means located transversely to said slot and intermediate said slot and said discharge means and having a pair of uniformly spaced first attachment means;

a bellows assembly comprising:

(a) an elongated rectangular bellows having a top wall and a bottom wall together defining an inflatable chamber therebetween and a pair of uniformly spaced resiliently deformable second attachment means located along both of the longer edges of said bellows and adapted to coact with said first attachment means to fixedly secure the longer edges of said bellows to said bellows retainer means,

(b) fluid connection means connected to said bellows for supplying air to and exhausting air from said inflatable chamber so as to cause said top wall of said bellows between said fixedly secured longer edges to be of a configuration which varies between concave and convex,

(c) porous foam secured to said top wall and overlying most of said top wall,

(d) an impervious film secured to said porous foam and overlying an portion of said porous foam coextensive with said cutoff plates;

whereby when said inflatable chamber is sufficiently inflated, said top wall between said fixedly secured longer edges, said porous foam and said impervious film are moved together into a convex shape with said film engaging said cutoff plates in a valving action to prevent flow through said slot and when said inflatable chamber is insufficiently inflated to hold said film in engagement with said cutoff plates, air flowing through said slot is divided into two flow paths defined by said film and respective ones of said cutoff plates before discharging through said discharge means.

4,811,576

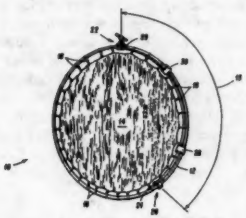
HOOP FOR STRETCHING ANIMAL PELTS

Russell G. Davis, c/o J. D. Fur Co., R.R. #1, Elbow Lake, Minn. 56531

Filed Dec. 28, 1987, Ser. No. 138,813

Int. Cl.[4] A01M *31/00*

U.S. Cl. 69—19.3 17 Claims



1. A pelt stretcher, comprising:

a metal rod formed into a hoop with its first and second ends juxtaposed to form first and second overlapping section on the respective ends thereof;

a first collar surrounding the second overlapping section;

first swivelled means for attaching the first collar to the first end of the rod;

means in said first collar for securing said second overlapping section against movement through said first collar;

a second collar surrounding the first overlapping section; and

second swivelled means for attaching the second collar to the second end of the rod;

4,811,577

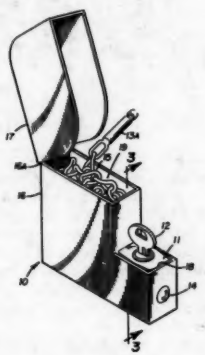
PORTABLE LOCKING DEVICE

Noel E. Webster, 4811 Alhambra Ave., Martinez, Calif. 94553, and Kimberly Meredith, 3118 Jen Ct., Concord, Calif. 94518

Continuation of Ser. No. 881,217, Jul. 2, 1986, abandoned. This application Aug. 21, 1987, Ser. No. 88,398

Int. Cl.[4] E05B *73/00*

U.S. Cl. 70—14 5 Claims



1. A compact portable locking device comprising:

(a) a compact portable substantially rectangular housing of a small size to substantially fit in the hand of an adult human being, said housing itself comprising;

(i) an upper hollow non-locking engaging cap portion, and

(ii) a lower complementary body portion defining an internal hollow chamber and wherein the cap portion and body portion are hingedly connected at one edge,

said cap portion hingedly operable to close said internal hollow chamber;

(b) a locking unit fixedly mounted within and occupying a portion of said internal hollow chamber, said locking unit comprising key locking means operable to secure an object at a location, including an externally opening receptacle cavity and an active locking element in said externally opening receptacle cavity; and

(c) a flexible securing member comprising a link chain having one end of said link chain permanently affixed to the locking unit within said internal hollow chamber, and having a pin element affixed at the other end of said link chain and said pin element being adapted to enter said receptacle cavity of said locking unit and to interlock therewith, wherein said internal hollow chamber receives and loosely stores said flexible securing member when said compact portable locking device is not in use.

4,811,578

PADLOCK WITH TAMPER-ACTUATED AUDIBLE AND/OR INAUDIBLE ALARM

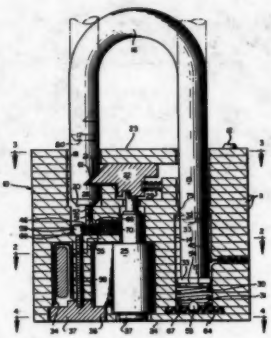
John F. Masoncup, Mount Prospect, and Thomas J. Mayer, Hoffman Estates, both of Ill., assignors to John F. Masoncup, Mount Prospect, Ill.

Continuation-in-part of Ser. No. 524,152, Aug. 18, 1983, Pat. No. 4,556,872. This application Jan. 18, 1985, Ser. No. 692,516

The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.

Int. Cl.[4] E05B *67/22, 39/00, 45/06*

U.S. Cl. 70—38 B **41 Claims**



1. A padlock with a tamper alarm, said padlock comprising:

a body;

a shackle having a long leg and a short leg;

means mounting said shackle for reciprocal movement thereof relative to said body, between an extended, open position, in which said short shackle leg is outside the body, and a plurality of depressed position for the shackle;

means in said body for receiving each of said shackle legs;

means normally urging said shackle to its extended position;

latch means for engaging one of said shackle legs when the shackle is in a first of its depressed positions and said short leg is inside the lock body;

lock means operable to disengage said latch means from said one shackle leg;

alarm means actuable to emit an alarm signal;

and means, responsive to the depression of the shackle to another of its depressed positions more depressed than said first depressed position, for actuating said alarm means as a test of its operativeness.

16. A padlock with a tamper alarm, said padlock comprising;

a body;

a shackle having a long leg and a short leg;

means mounting said shackle for reciprocal movement thereof relative to said body, between an extended, open position, in which said short shackle leg is outside the body, and a depressed position for the shackle;

means in said body for receiving each of said shackle legs;

means normally urging said shackle to its extended position;

latch means for engaging one of said shackle legs when the shackle is in its depressed position and said short leg is inside the shackle body;

lock means operable to disengage said latch means from said one shackle leg;

audible alarm means actuable between an on condition for sounding an alarm and a normally off condition;

means in said body for containing said alarm means;

and means for actuating said audible alarm means to its on condition in response to a violation of said padlock;

said receiving means for the other shackle leg communicating with said means for containing the alarm means and comprising means defining a sound port for said audible alarm means when said other shackle leg is outside of its receiving means.

17. A padlock as recited in claim 16 wherein said means for actuating the alarm means in response to a violation comprises means for doing so in response to one of:

(a) severance of the shackle; and

(b) forced removal of the other shackle leg from its receiving means.

4,811,579

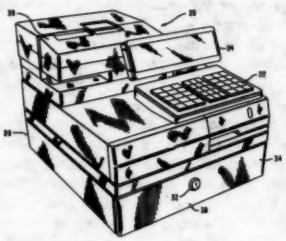
CASH DRAWER RELEASE MECHANISM

Dale R. Lyons, Cambridge; Raymond L. Lawter, Millersburg, and Don E. Beam, Cambridge, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 27, 1987, Ser. No. 125,853

Int. Cl.[4] E05B *65/4C*

U.S. Cl. 70—85 **12 Claims**



1. A cash drawer assembly including a support member and a cash drawer slidably mounted on said support member for movement between an open and a closed position comprising:

a rotatably mounted latch member mounted to said support member for movement between a latched and unlatched position;

means engaging said latch member for normally urging the latch member to the unlatched position;

means mounted on said cash drawer for engaging and moving said latch member to a latched position latching the cash drawer in a closed position upon movement of the cash drawer to a closed position;

resilient means mounted on said support member and engaging said cash drawer when in a closed position for normally urging said cash drawer to a open position.

a rotatably mounted blocking member positioned adjacent said latch member, said blocking member including a latching portion adapted for movement to a position engaging said latch member upon movement of the cash drawer to a closed position, thereby holding the latch member in a latched position;

an elongated actuator member rotatably mounted on said support member and having one end positioned adjacent said blocking member and the other end positioned at the front edge of the support member;

a drive member slidably mounted on the front edge of said support member and having a first cam surface positioned adjacent the other end of said actuating member; and

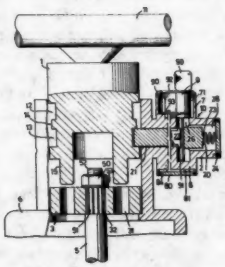
a key actuated locking member rotatably mounted in the front edge of the cash drawer, said locking member positioned adjacent the drive member when the cash drawer is in a closed position whereby the locking member, when rotated in a first direction by a key member, moves the drive member to an actuated position enabling the first cam surface to rotate the other end of said actuator member whereby the said one end of the actuator member is rotated to a position moving the blocking member from engagement with the latch member releasing the latch member from engagement with the cash drawer enabling the resilient member to move the cash drawer to an open position.

4,811,580

STEERING WHEEL RELEASE LOCKING MECHANISM

Jaw J. Jang, 6 Fl., No. 36-5, Ho-Ping Rd, Pan-Chiao City, Taipei Hsien, Taiwan

Filed Jul. 26, 1988, Ser. No. 224,386
Int. Cl.[4] B60R *25/02*
U.S. Cl. 70—218 **1 Claim**



1. A steering wheel release lock comprising the combination of:

(a) a steering wheel block (1) being substantially cylindrical in shape and having an upper track (12) and a lower track (13) thereon; said upper and lower track (12, 13) being parallel to each other and having a same center axis as said cylindrical steering block (1); a flange (14) being set between said upper and lower track (12, 13); a steering wheel being fixed at an upper end of said steering wheel block (1); said steering wheel block (1) having a plurality of fixing prongs (15) on a lower end thereof;

(b) an actuating disk (3) having a plurality of fixing holes (31) corresponding with said plurality of fixing prongs (15) for slidably receiving said fixing prongs therein when said steering wheel release lock is in an engaged position;

(c) a steering shaft (5) which has a plurality of vertically oriented teeth (51) on an upper end thereof; said steering shaft (5) also having a threaded end (52) on an uppermost end thereof for engaging with a nut (50) so as to secure said actuating disk (3) to said steering shaft (5); and

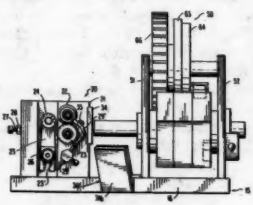
(d) a steering column (6) which has a lock housing (10) projecting from one side thereof; said lock housing (10) comprising an upper lock seat (7), a side member (2), and a lower lock seat (8); said upper lock seat (7) having a cavity (71) at an upper end thereof which opens into an opening (26) in a lower end thereof; said opening (26) being cylindrical in shape and extending down to an upper end of said lower lock seat (8); said opening (26) also communicating with a passage (27) which opens into said steering column (6); said side member (2) protruding from a central part of said lock housing (10) and having a receptacle (28) therein for receiving a large end of a bolt (21); said side member (2) also having a side cover plate (24) fixed at an end thereof; a spring-loaded bolt (21) having a square channel (22) extending therethrough; said cavity (71) receiving and securing a lock head (9) therein; said lock head (9) having a plate (91) extending downwards therefrom into said opening (26) and channel (22), said plate (91) being turnable by a key (99) so as to move said bolt (21) laterally in said passage (27) and engage said bolt (21) with said upper or lower track (12, 13); said fixing prongs (15) being engaged with said fixing holes (31) when said bolt (21) is set in said upper track (12); said fixing prongs (15) being disengaged from said fixing holes (31) when said bolt (21) is set in said lower track (13) so that turning said steering wheel (11) does not actuate said actuating disk (3) and steering shaft (5).

4,811,581

APPARATUS FOR PREFORMING A SUBSTANTIALLY FLAT BLANK OF AN OPEN CLAMP

Hans Oetiker, Oberdorfstrasse 21, CH-8810 Horgen 2, Switzerland

Division of Ser. No. 563,823, Dec. 21, 1983, Pat. No. 4,633,698. This application Nov. 4, 1986, Ser. No. 926,907
Int. Cl.[4] B21D *5/14, 53/36;* B21C *51/00*
U.S. Cl. 72—14 **24 Claims**



1. A machine for preforming individually pre-cut plastically deformable substantially flat blanks of band material each provided with integral mechanical interconnecting means near the free ends to form an individual open clamp adapted to be mechanically interconnected by said mechanical interconnecting means, when the free ends of the blank overlap, into a circular clamp having a configuration, when leaving the machine, at least approximately corresponding to the configuration of the clamp when being installed about an object to be fastened onto a relatively fixed, generally circular part, comprising roller means for feeding the pre-cut flat blank through the machine including a pair of rollers having predetermined external configuration for receiving each blank and its respective integral mechanical interconnecting means said rollers being spaced from one another a distance essentially corresponding to the thickness of an individual flat blank, drive means for rotating said pair of rollers to impart a linear movement to the individual pre-cut blank as it passes through the roller pair, guide means ahead of said roller pair for guiding a flat blank toward and through the space between said pair of rollers along a substantially rectilinear path, and further means including first deflection surface means downstream of said pair of rollers and operable to engage with said blank for deforming the individual pre-cut flat blank into generally circular shape corresponding to said generally circular configuration and of such diameter that the free ends thereof overlap, second deflection surface means downstream of said first deflection surface means and operable to engage with the pre-cut blank deformed by said first deflection surface means before the ends thereof overlap in the generally circular configuration

imparted thereto by said first deflection surface means to plastically deform the overlapping free ends of the open clamp in order to exhibit a remaining axial spacing from one another by a relatively small axial distance so that the preformed open clamp, after leaving said machine, has said generally circular shape with the overlapping ends thereof axially spaced to thereby facilitate radial assembly of the thus preformed clamp over the object to be fastened. and control means for operating said machine for a predetermined length of time so that said precut blank is red through said pair of rollers, first and second deflection surface means to deform said blank with said overlapping and axially spaced ends.

4,811,582

STRAIN RATE CONTROL OF SUPERPLASTIC FORMING

James M. Story, Pittsburgh, Pa., and Matthew P. Sklad, Hamilton, Canada, assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 21, 1987, Ser. No. 136,743
Int. Cl.[4] B21D *26/02*
U.S. Cl. 72—16 **5 Claims**

1. A method of superplastically forming a complex part over the period of a forming cycle, the method comprising:

providing a blank of material having superplastic characteristics when heated to within a certain range of temperatures,

heating said blank to within said range,

providing an analytical model that determines a location or locations of the blank that will deform most rapidly when forming pressure is applied to the blank,

forming said part by applying pressure to the blank,

monitoring displacement: of blank material at said location or locations while the blank is being deformed,

calculating the strain rate, and

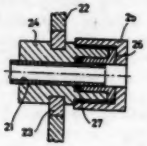
providing feedback control to effect a strain rate that reduces the tendency of the blank and part to cavitate for the location or locations that will deform most rapidly by varying the rate at which pressure is applied to the blank.

4,811,583

FEED-THROUGH ELEMENTS THEREFOR

Hugo Lievens, Gent, and Wilfried Coppens, Kortrijk-Marke, both of Belgium, assignors to N.V. Bekaert S.A., Zwevegem, Belgium

Filed Oct. 9, 1987, Ser. No. 106,367
Claims priority, application Netherlands, Oct. 23, 1986, 86/02661
Int. Cl.[4] B21F *21/00*; B21D *37/16*; C21D *9/54*; C23C *14/00*
U.S. Cl. 72—38 **5 Claims**



1. A feed-through element for application in a vacuum apparatus for the continuous feeding therethrough of material with wire character to be treated therein comprising a tubular casing with an inside diameter that is larger than the outside diameter of the material to be fed therethrough, the inside diameter and length of the tubular casing being determined and selected by reference to the diameter of said wire material according to the following relationship: the ratio of free surface (S-free), to the inside cross-sectional area of the tubular casing does not exceed 30% and the ratio of the length of the tubular casing (L) to the free surface (L/S-free) is at least 500 mm^{-1}; and wherein said free surface is the difference between the cross-sectional areas of said tubular casing and said wire material.

4,811,584

THERMAL PROCESSING METHODS

Daniel J. Brimm, and James R. Gramse, both c/o Chem-tronics, Inc., P.O. Box 1604, El Cajon, Calif. 92022

Continuation of Ser. No. 740,552, Jun. 3, 1985, abandoned, which is a continuation of Ser. No. 260,748, May 5, 1981, abandoned. This application Feb. 9, 1987, Ser. No. 12,569
Int. Cl.[4] B21D *22/12*
U.S. Cl. 72—63 **18 Claims**

1. A method of heat treating a component which has at least one surface which is stressed and which is coated with a material that it is desired to retain, said method comprising the steps of: heating said component to a temperature above that at which said stresses would be relieved and protecting said surface from relief of the stresses therein by keeping said surface below the stress relieving temperature as the rest of the component is heated to, and above, said stress relieving temperature, said surface being kept below said stress relieving temperature while the rest of said component is heated to a temperature thereabove by embracing that portion of the component which carries said surface with a muff and circulating a coolant through said muff and into heat exchange relationship with said portion of the component while said component is at a temperature above the temperature at which the stress in said surface would be relieved.

4,811,585

DEVICE FOR FORMING ASYMMETRICAL ARTICLES BY ROLLING

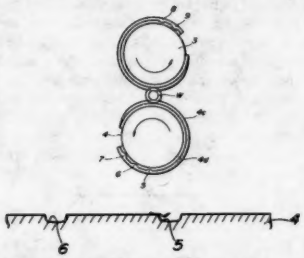
Ryoichi Takahashi, Fuji; Tomoyoshi Sato, Fujisawa; Hidehiko Tsukamoto, Hiroshima; Kazuo Morimoto, Hiroshima, and Nobutaka Maeda, Hiroshima, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Mar. 30, 1987, Ser. No. 32,109
Claims priority, application Japan, Apr. 2, 1986, 61-75954; Apr. 2, 1986, 61-75955; Apr. 16, 1986, 61-87704; Sep. 30, 1986, 61-150140
Int. Cl.[4] B21D *7/00*; B21K *1/08*
U.S. Cl. 72—108 **12 Claims**

1. A device for forming an asymmetrical article by rolling, comprising:

a plurality of driven cylindrical dies in fixed, spaced apart relation to each other between which an article may be clamped to be rolled as said dies are driven in opposite rotational directions, said dies being rotatable about parallel axis and having means for rotatably clasping said article about its axis so that the axis of said article extends parallel to said die axis, said dies each having die faces which are formed with circumferentially spaced independent patterns separated from each other in the direction of rolling of the article and capable of being sequentially

brought into engagement with a particular portion of the article for thereby forming a part of the article at said particular portion, said part of the article being asymmetrical about the axis of the article.



4,811,586

LEVELING MACHINE FOR STEEL SHEET AND STRIP

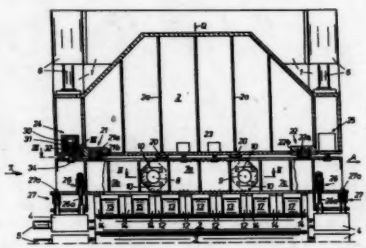
Willi Benz, Neuss, and Walter Eltinger, Düsseldorf, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 11, 1988, Ser. No. 142,503

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1987, 3700555

Int. Cl.[4] B21D 1/02

U.S. Cl. 72—165 5 Claims



1. In a leveling machine for steel sheet and strip, including upper and lower horizontally extending leveler rolls arranged offset relative to each other and supported along their length by means of support rollers mounted in bearing blocks, the support rollers being supported in crossheads, wherein at least the upper crosshead is adjustable for positioning the leveler rolls, changing cartridges being arranged between the crossheads and the leveler rolls for exchanging a set each of leveler rolls and support rolls, the changing cartridges being of an articulated construction for a tilting yoke adjustment, whereby portions of the changing cartridges and associated groups of support rollers can be preadjusted on the two sides of the middle vertically extending transverse the plane of the crossheads and leveler rolls to a fitted position by means of first tension members which are fixed to the corresponding crosshead, the tilting movements being effected about axes which extend perpendicularly of the leveler rolls, the preadjustment serving to compensate the sagging of the leveler rolls while taking into consideration the bending of the crossheads due to the leveling force, so that the leveler rolls are straight during leveling, the improvement comprising the crossheads being single-piece crossheads, the changing cartridges being divided perpendicularly of the leveler rolls into a middle cartridge portion having two ends and two outer cartridge portions connected to the middle portion by means of two intermediate joints at the ends of the middle cartridge portion, each of the cartridge portions carrying the bearing blocks of the groups of support rollers, the middle cartridge portion of each cartridge being supported in the region of its ends on the corresponding crosshead by two spaced-apart rigid supports arranged symmetrically relative to the middle vertically extending transverse plane of the crossheads and leveler rolls, the pivoting positions of the two outer cartridge portions relative to the corresponding crosshead being limited by adjustable stops attached to the crosshead, whereby the preadjusting forces during tilting yoke adjustment and the structural weight of the crosshead are minimized.

4,811,587

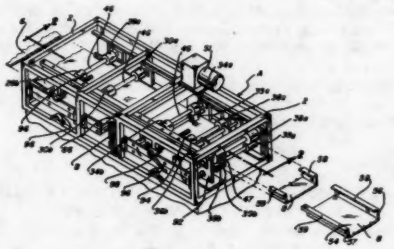
APPARATUS FOR MAKING PANELS

Gary A. Knudson, 17356 W. 57th Ave., Golden, Colo. 80401

Filed Oct. 28, 1987, Ser. No. 114,460

Int. Cl.[4] B21D 5/08

U.S. Cl. 72—181 8 Claims



1. Apparatus for making and cutting a panel comprising:

a frame;

a plurality of sets of upper and lower forming rollers at spaced intervals along and within said frame for shaping a generally flat sheet into a panel having a base and at least one sidewall extending from a side of the base, each lower roller of each set having a first lower roller portion and a second lower roller portion that is movable laterally relative to the associated first lower roller portion to form panels of different widths, said upper roller of each set having first upper roller portion and a second upper roller portion that is movable laterally relative to the first upper roller part to form panels of different widths;

a pair of spaced base dies for supporting said panel;

at least one pair of spaced side support dies for supporting said sidewall of the panel;

a cutting blade movable between a first position and a second position past and in cooperation with said side support and base dies to shear said panel; and

a laterally moveable side carrier to which said movable roller portions are mounted for lateral movement of said movable roller portions to form panels of different widths and to which said pair of spaced side support dies are mounted for lateral movement of said side support dies relative to said base dies for supporting panels of different widths during said shearing, said movable roller portions and said spaced side support dies being moved simultaneously upon movement of said laterally movable side carrier.

4,811,588

HEAT CONSERVATION OF HOT METAL SLABS

James T. Watson, Chepstow, United Kingdom, assignor to British Steel plc., United Kingdom

Filed Apr. 1, 1988, Ser. No. 176,770
Claims priority, application United Kingdom, Apr. 15, 1987, 8709133
Int. Cl.[4] B21B *43/00, 45/00*
U.S. Cl. 72—202 20 Claims

1. A method of shielding metal slabs from heat loss during inter-stand transport on a roller table in a rolling mill comprising:

positioning an inverted channel-shaped heatinsulating housing over the roller table at a first position adjacent an upstream mill stand,

introducing the metal slab through a trailing end of the housing as the slab issues from the upstream mill stand onto said roller table until the slab is completely within the housing and in contact with said roller table,

maintaining the slab in contact with said roller table while transporting the housing and slab together along the roller table to a second position adjacent a downstream mill stand,

removing the metal slab from the housing through a leading end of the housing and

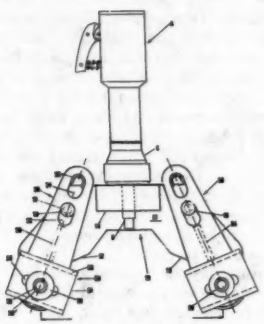
returning the housing to said first position.

4,811,589

FORK MEMBER FOR PIPE-BENDING APPARATUS TO SUPPORT SPACED PIPE ABUTMENT

Alessandro Caporusso, Via Pantanelle, 21, and Mario Caporusso, both of Piedimonte San Germano, Frosinone, Italy

Filed Nov. 12, 1987, Ser. No. 119,173
Claims priority, application Italy, Nov. 28, 1986, 36281/86[U]
Int. Cl.[4] B21D *9/05*
U.S. Cl. 72—389 2 Claims



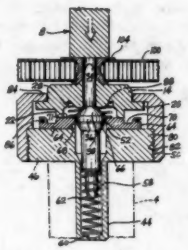
1. A fork member for the bending section of a pipe-bending apparatus, comprising a substantially flat base having a member adapted to be connected to a pipe-bending apparatus, said base having a pair of legs thereon and a pin protruding from the base adjacent each leg, each leg having a plurality of slots therein extending in different radial directions from the associated said pin, the slots and pins one one said leg being symmetrical to the slots and pins on the other said leg on opposite sides of an imaginary plane passing through said connecting member, and an elongated arm adapted to be detachably connected to each said leg, each arm having a plurality of openings therethrough elongated in the lengthwise direction of the elongated arm, each said opening being adapted to receive the associated said pin therein, and a rib extending lengthwise of each said leg and adapted to be selectively positioned in a selected one of said slots when the associated said pin is disposed in one of said elongated openings, each said pin being headed and each said opening being of keyhole configuration to receive the head of the associated pin in one position of the arm and to prevent exit of the pin in another position of the associated arm when the rib is disposed in a selected slot.

4,811,590

ROLL DIE ASSEMBLY WITH MISALIGNMENT DAMAGE PROTECTION

Kwun-Wing W. Cheung, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 16, 1988, Ser. No. 157,476
Int. Cl.[4] B21D *19/00*
U.S. Cl. 72—482 14 Claims



1. For use in a press of the type having first and second opposing members that are axially movable relative to each other to exert a force on a workpiece positioned therebetween, and a pilot pin carried by said first member and adapted to be received into an opening in the workpiece, the improvement comprising:

mounting means for mounting the pin to slide axially relative to said first member;

biasing means for biasing the pin axially outwardly toward said second member; said biasing means being yieldable to allow the pin to move axially inwardly when the pin is misaligned with said opening and said members are moved axially toward each other, to thereby prevent the pin from damaging the workpiece; and

retracting means, responsive to axially inward movement of the pin, for allowing said first member to move axially inwardly to thereby provide clearance for the workpiece between said first and second members.

4,811,591

DEVICE FOR CHECKING THE SURFACE CONDITION OF MATERIALS

Antoine Antoine, F-08370 La Ferte Sur Chiers, France

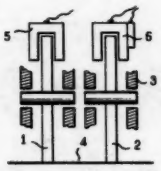
PCT No. PCT/FR87/00008, § 371 Date Sep. 10, 1987, § 102(e) Date Sep. 10, 1987, PCT Pub. No. WO87/04235, PCT Pub. Date Jul. 16, 1987
PCT Filed Jan. 12, 1987, Ser. No. 101,293
Claims priority, application France, Jan. 13, 1986, 8600470
Int. Cl.[4] G01N *19/02, 19/04*
U.S. Cl. 73—9 9 Claims

1. A device for measuring the surface condition of material, comprising:

an adhesion measuring sensor having a sensing element maintained in contact with a surface of the material to be measured and which moves relative to the surface thereof,

said sensing element including two independent wheels having running treads in the same surface condition, one of said wheels being unrestrained and the other of said wheels being operatively coupled to a progressively acting brake;

means for measuring the rotational speeds of the wheels and the braking torque;



a computer means operatively coupled to said adhesion measuring sensor; and

means for transmitting said rotational speeds of the wheels and said braking torque to said computer means, said computer means including means for performing comparative measurements from said speeds of the wheels and the braking torque transmitted thereto, and means for displaying the results of said comparative measurements.

4,811,592

SPECIFIC GRAVITY DETECTOR

Shinsuke Miura, and Susumu Ishizuka, both of Tokyo, Japan, assignors to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Nov. 27, 1987, Ser. No. 125,986

Claims priority, application Japan, Nov. 28, 1986, 61-285672

Int. Cl.[4] G01N *9/24*

U.S. Cl. 73—32 A **2 Claims**

1. A specific gravity detector for detecting the specific gravity of a liquid, said detector comprising:

an inertia mass fixed in the detector;

an electromechanical vibrator rigidly connected to said inertial mass and having a central axis, said vibrator capable of vibrating about the central axis;

a transmission shaft connected to said vibrator at one end thereof and extending coaxially therefrom;

a detector member connected to said transmission shaft at the other end thereof and extending coaxially therefrom, said detector member vibratable via said transmission shaft by said vibrator about the central axis thereof; and

resonant frequency establishing means for establishing a desired resonant frequency of said vibrator, said resonant frequency vibration means comprising a mass having a predetermined moment of inertia and fitted around said transmission shaft at a locating thereon spaced from said vibrator by a distance corresponding to said desired resonant frequency.

4,811,593

VISCOSITY DETECTOR

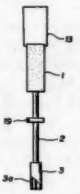
Shinsuke Miura, and Susumu Ishizuka, both of Tokyo, Japan, assignors to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1987, Ser. No. 125,602

Claims priority, application Japan, Nov. 27, 1986, 61-282586

Int. Cl.[4] G01N *11/10*

U.S. Cl. 73—54 **2 Claims**



1. A viscosity detector for detecting the viscosity of a liquid, said detector comprising:

an inertia mass fixed in the detector;

an electromechanical vibrator rigidly connected to said inertia mass and having a central axis, said vibrator capable of vibrating about the central axis;

a transmission shaft connected to said vibrator at one end thereof and extending coaxially from said vibrator;

a detector member connected to said transmission shaft at the other end thereof and extending coaxially therefrom, said detector member vibratable via said transmission shaft by said vibrator above the central axis thereof, and said detector member having an outer circumferential surface along which viscous resistance offered by a liquid acts when the detector member is immersed in the liquid and vibrated thereby detecting the viscous resistance offered by the liquid;

said vibrator including converting means for converting viscous resistance of a liquid acting on the detector member at said circumferential surface thereof into an electric signal corresponding to the viscosity of the liquid; and

resonant frequency establishing means for establishing a desired resonant frequency of said vibrator, said resonant frequency establishing means comprising a mass having a predetermined moment of inertia and fitted around said transmission shaft at a location thereof spaced from said vibrator by a distance corresponding to said desired resonant frequency.

4,811,594

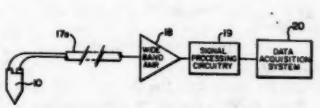
TOPOGRAPHY SENSOR

James E. Dvorsky, Columbus, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio

Filed Apr. 25, 1988, Ser. No. 185,385

Int. Cl.[4] G01B *7/34*

U.S. Cl. 73—105 **14 Claims**



4. A stylus, for use in measuring the topography of a surface by contact, comprising:

(a) a piezoelectric polymer film having opposite principal surfaces and configured to have a body portion with a joined tip portion for contacting the surface to be mea-

sured and with joined tab portions for electrical connection to output receiving apparatus; and

(b) a separate electrically conductive film adhered to each principal surface of said piezoelectric polymer film,

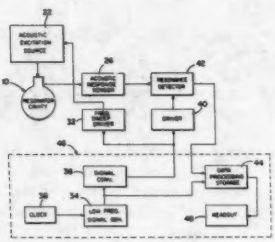
said electrically conductive films conducting an electrical output signal generated by said piezoelectric polymer film whenever said joined tip portion is moved to have a changed arcuate form as a result of contact with the surface to be measured.

4,811,595

SYSTEM FOR MONITORING FLUENT MATERIAL WITHIN A CONTAINER

Robert D. Marciniak, and Lynn A. Poole, both of State College, Pa., assignors to Applied Acoustic Research, Inc., State College, Pa.

Filed Apr. 6, 1987, Ser. No. 35,003
Int. Cl.[4] G01F *23/28*
U.S. Cl. 73—149 **18 Claims**



1. In a method of monitoring an unknown volume of a fluent material within a container by directing acoustical energy at an excitation frequency into the container and sensing acoustical vibrations emitted therefrom having phase and amplitude characteristics, the improvement comprising the steps of: varying the excitation frequency to sweep a frequency band between limits respectively corresponding to cavity resonance conditions of the container when full and empty: measuring at least one of the characteristics of the acoustical vibrations during said variation in the excitation frequency; detecting abrupt changes in said one of the measured characteristics of the acoustical vibrations; registering the excitation frequency during said detection of the abrupt changes in the measured characteristic; and calculating the unknown volume of the fluent material from said registered excitation frequency corresponding to cavity resonance conditions of the container between said limits of the frequency band.

4,811,596

ARRANGEMENT FOR TANK CONTENT MEASUREMENT OF AN OPERATING-MEDIUM TANK OF A VEHICLE

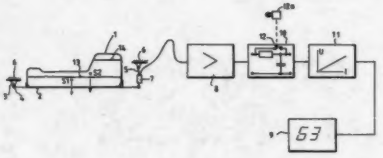
Eikelberg Wolfgang, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagen AG, Wolfsburg, Fed. Rep. of Germany

Filed Nov. 17, 1987, Ser. No. 121,602
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1986, 3639446
Int. Cl.[4] G01F *17/00*
U.S. Cl. 73—149 **4 Claims**

1. A system for measuring the contents of a tank containing fuel for a motor vehicle engine, said system comprising:

means including an essentially horizontal spindle supporting said tank for pivotal movement in response to gravity about said spindle at a position such that the center of gravity at all fuel levels is disposed on the same side of said spindle; and

electrical measuring means operatively coupled to said tank, at a point disposed on the same side thereof as its center of gravity, for producing an electrical output signal having a value proportional to the force exerted on said measuring means by pivotal movement of said tank about said spindle, as a measure of tank content, said electrical measuring means including damping circuit means for damping fluctuations in said output signal due to rocking motion of the tank contents, and a normally open contact connected in parallel with said damping circuit means adapted to be momentarily closed for bridging the damping circuit only when the ignition of the vehicle engine is connected.



4,811,597

WEIGHT-ON-BIT AND TORQUE MEASURING APPARATUS

James B. Hebel, Houston, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Jun. 8, 1988, Ser. No. 203,969
Int. Cl.[4] E21B *47/00*
U.S. Cl. 73—151 **31 Claims**

1. In a drill string assembly which is adapted to be utilized in a well bore, the assembly having a lower end which terminates with a rock bit for drilling the well bore, the assembly further having a plurality of drill pipes having an external cylindrical wall which cooperates with the well bore to form an outer well bore annulus, the inside of the drill pipes forming a drill string bore, a drill string sub adapted to be connected into the lower section of the drill string assembly, for measuring the weight and the torque acting on the rock bit, comprising;

a tubular housing having an outside diameter equal to the diameter of the drill string and an internal bore, said housing supporting the weight of said drill string assembly;

a strain amplifier comprising a uniform cylindrical section contiguous to said tubular housing and attached thereto to enable a portion of the support stresses to pass through said strain amplifier;

means mounted on said strain amplifier for sensing the stresses of torque and compression passing therethrough; and

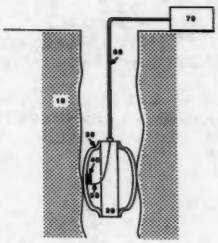
means for mechanically compensating for the axial stresses due to the local pressure differential between the drill string bore and the well bore annulus.

4,811,598

DOWNHOLE TEMPERATURE MEASUREMENTS

Justin M. Dillier, La Habra, and Richard H. Clark, Bakersfield, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Aug. 28, 1987, Ser. No. 90,496
Int. Cl.[4] E21B *49/00*
U.S. Cl. 73—154 11 Claims



1. An apparatus for developing a temperature profile of a well, said apparatus comprising:

a spring bow centralizer, wherein the bow of said centralizer contacts the sidewall of the well; and

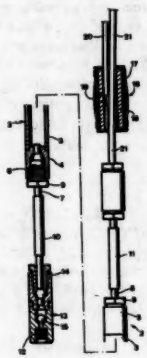
a temperature probe attached to the underside of said bow opposite to a point of contact with the sidewall.

4,811,599

BOREHOLE SAMPLING

Richard L. Johnson, 19600 N.W. Von Neumann Dr., Beaverton, Oreg. 97006-1999; John A. Cherry, 26 Academy Crescent, Waterloo, Ontario, N2L 5H7, Canada, and James F. Pankow, 19600 N.W. Von Neumann Dr., Beaverton, Oreg. 97006-1999

Filed Oct. 16, 1986, Ser. No. 919,489
Claims priority, application Canada, Oct. 21, 1985, 493411
Int. Cl.[4] E21B *49/08*
U.S. Cl. 73—155 15 Claims



1. Sampler, which is suitable for use in and with apparatus for collecting a sample of liquid from a deep borehole, wherein:

the sampler includes a sample-collection-reservoir, which is suitable for containing a sample of the liquid, and which is adapted for lowering into the borehole;

the reservoir is provided with a remotely operable check valve means, and a directly operable sealing means, both of which are operable between a respective open condition and a respective closed condition;

when in the open condition the means are effective to allow liquid to enter and leave the reservoir and when in the closed condition the means are effective to prevent liquid from entering or leaving the reservoir;

the apparatus includes a means for supplying a check valve control pressure from above ground, remote from the reservoir and sealing means, and outside the borehole;

the sampler includes a means for conducting the said pressure to check valve means when the reservoir is within the borehole;

the sampler includes a means responsive to the said applied pressure supplied from above ground, for operating the check valve means between the said open and closed conditions;

the sampler includes a means for operating the sealing means directly manually;

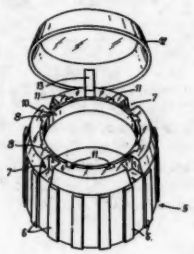
and the arrangement of the sampler is such that the means for operating the sealing means is accessible for direct manual operation when the sampler is outside the borehole.

4,811,600

DEVICE FOR MAKING FLOWMETER TAMPERPROOF

Thierry Robitaille, Mulhouse, France, assignor to Sappel, Saint-Louis, France

Filed Apr. 15, 1987, Ser. No. 41,435
Claims priority, application France, Apr. 21, 1986, 86.05683
Int. Cl.[4] G01F *15/14*
U.S. Cl. 73—272 R 4 Claims



1. A tamperproof device for covering a flowmeter having a standard threaded lock nut (2) with a shoulder (3), comprising

a cylindrical skirt (5) having a series of recesses (8) regularly spaced on the periphery of an upper edge of an inside face thereof, and having hooks (9) extending vertically downwardly from the surfaces of said recesses (8), perpendicular to the skirt (5), to engage said shoulder (3) of said standard threaded lock nut (2),

a ring with externally projecting pins (11) engaging with the recesses (8), and

a cover (12) with an opening and closing hinge (13) pivoted in an opening in said upper edge of the skirt (5).

4,811,601

METHOD AND APPARATUS FOR MEASURING THE CHANGE IN VOLUME WITH CHANGE IN TEMPERATURE OF LIQUID IN TANKS

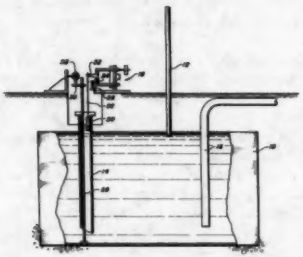
Peter J. Tolan, 30 Greenfield La., Scituate, Mass. 02066

Filed Oct. 11, 1983, Ser. No. 540,799
Int. Cl.[4] G01F *23/00*
U.S. Cl. 73—29 B 9 Claims

1. The method of measuring the change in volume with change in temperature of a quantity of liquid in a tank, comprising placing in said tank a length of material having a known temperature coefficient of expansion in relation to the tempera-

ture coefficient of expansion of the liquid in the tank, said length of material having a length and orientation such that it extends substantially from the bottom of the liquid to the top thereof, measuring the change of length of said length of material over a period of time, and computing the change in volume of the liquid in the tank from the change in length of said length of material.

6. A test probe assembly for measuring the change in volume



with change in temperature of a liquid in a tank, comprising an elongated rod of material having a known temperature coefficient of expansion in relation to the temperature coefficient of expansion of the liquid in the tank, said rod having a length such that it can extend from the bottom of the tank into the fill tube thereof, an RF target mounted on the rod, and an RF radiating and sensing device mounted in fixed relation to the tank in position for measuring the change of position of said target.

4,811,602

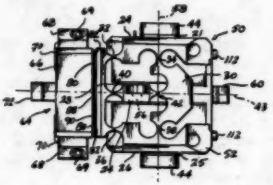
FRAME ASSEMBLY AND DITHER DRIVE FOR A CORIOLIS RATE SENSOR

Rand H. Hulsing, Redmond, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Division of Ser. No. 075,039, Jul. 17, 1987, Pat. No. 4,782,700. This application Jul. 26, 1988, Ser. No. 224,565

Int. Cl.[4] G01P *3/46*

U.S. Cl. 73—505 **22 Claims**



1. Apparatus for producing signals indicative of both a Coriolis rate and an acceleration along a preferred axis while decoupling extraneous motions that would introduce errors in said signals, comprising:

(a) a parallelogram frame including two accelerometers support surfaces attached to opposite ends of a flex member, the flex member including a plurality of flexures having parallel bending axes about which the frame pivots, two of the flexures that are disposed at opposite ends of one side of the flexure member having a cross axis that is substantially parallel to the accelerometer support surfaces;

(b) two accelerometers, each mounted on one of the accelerometer support surfaces and having a preferred axis for sensing acceleration that is aligned with one of said two flexures, and each further having a center of percussion that is rigidly coupled to the other by said two flexures and said one side of the flex member; and

(c) driving means, disposed adjacent to the parallelogram frame, for driving the accelerometers at a desired frequency, causing the accelerometers to vibrate back and forth in a direction substantially transverse to their preferred axes as the parallelogram frame pivots at the flexures.

4,811,603

TACHOMETRIC GENERATOR

Rodolfo Bitetti, Milan, Italy, assignor to Veglia Borletti S.r.l., Milan, Italy

Filed Sep. 25, 1987, Ser. No. 100,954

Claims priority, application Italy, Oct. 24, 1986, 53995/86[U]

Int. Cl.[4] G01P *1/04*

U.S. Cl. 73—493 **7 Claims**

1. A tachometric generator of the type comprising at least one main shaft connectable to a drive take-off from a vehicle and driven to rotate with an angular velocity proportional to the speed of displacement of the said vehicle, and transducer means for the generation of electrical signals variable according to said speed, said generator comprising: an output shaft (16) housable in said outer body (2, 3) and torsionally connectable to said main shaft (12); said output shaft (16) being connectable to external mechanical transmission means, said main shaft (12) connected to said drive take-off by means of an input shaft (24) and torsionally coupled to said transducer means (18), said main shaft (12) and input shaft (24) being connected together by means of a ball joint coupling (23) which includes a ball element (26) fixed to said input shaft (24) and a hollow element (25) fixed to said main shaft (12), said ball element (26) including at least one radial projection (35) which engages a corresponding seat (32) of said hollow element (25) to provide torsional coupling between said input shaft (24) and said main shaft (12).

4,811,604

ACCELEROMETERS

George W. Browning, Stevenage, United Kingdom, assignor to British Aerospace Public Limited Company, London, England

Filed May 21, 1986, Ser. No. 865,391

Int. Cl.[4] G01P *15/12*

U.S. Cl. 73—517 R **11 Claims**

1. An accelerometer comprising:

a flexible beam member,

support means for supporting said beam member,

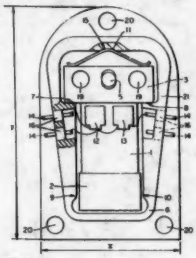
mounting means for mounting the beam member with respect to the support means,

an inertial mass carried by the beam member and spaced from the mounting means; and

spring means engaged between the mounting means and the support means for biasing same apart so as to move in a plane transverse to one direction,

the beam member being resiliently deformable in said one

direction to permit relative movement between the inertial mass and the support means in response to acceleration experience by the accelerometer in said one direction and



the beam member also being able to move bodily relative to the support means in said plane transverse to said one direction against the action of the spring means.

4,811,605

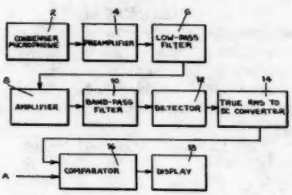
APPARATUS AND METHOD FOR INSPECTING THE DEGRADATION OF A GAS NOZZLE

Francois Nadeau, St-Bruno, and Michael T. Braeuel, St-Lambert, both of Canada, assignors to Canadian Patents and Development Limited/Societe Canadienne des Brevets et D'Exploitation Limitee, Ottawa, Canada

Filed Feb. 29, 1988, Ser. No. 162,071

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—645 **11 Claims**



1. A method for inspecting the degradation of a gas nozzle, said nozzle being of the type that can produce a whistle when a gas is blown through said nozzle, comprising the steps of:

(a) detecting an acoustic signal emitted by said nozzle when said gas is blown through said nozzle, said gas having a pressure selected to produce an acoustic resonance at a certain frequency;

(b) generating an electrical signal responsive to said acoustic signal detected in said step (a);

(c) band pass filtering said electrical signal at said frequency;

(d) detecting the amplitude of said electrical signal at said frequency;

(e) comparing the amplitude of said electrical signal with a reference amplitude corresponding to a reference nozzle; and

(f) displaying a signal indicative of the degradation of said nozzle according to the signal resulting from said comparing step (e).

4,811,606

MASS FLOWMETER

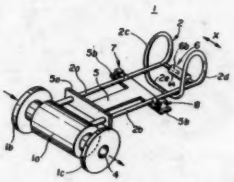
Hiroaki Hasegawa, Kawasaki; Yasuji Miyata, Yokohama; Koyata Sugimoto, Tokyo, and Akira Nakamura, Hiratsuka, all of Japan, assignors to Tokico, Ltd., Kanagawa, Japan

Filed Apr. 19, 1988, Ser. No. 183,606

Claims priority, application Japan, Apr. 20, 1987, 62-97183; Aug. 20, 1987, 62-206985

Int. Cl.[4] G01F *1/84*

U.S. Cl. 73—861.38 **8 Claims**



1. A mass flowmeter for measuring a mass flow rate of a fluid by measuring the magnitude of the Coriolis force working on the fluid comprising:

passage means comprising a first straight tube portion for passing the fluid introduced thereto from an inlet formed at an end thereof toward a first direction, a second first straight tube portion extending in parallel to the first straight tube portion for passing the fluid toward a second direction which is opposite to the first direction to an outlet at an end thereof from which the fluid exits, and a flexible intermediate tube portion connecting the other end of the first straight tube portion and the other end of the second straight tube portion;

fulcrum means disposed on the first and second straight tube portions relatively close to the inlet and outlet for limiting the movement of the first and second straight tube portions;

vibrating means disposed on the first and second straight tube portions relatively close to the the other ends for applying vibration so that the first and second straight tube portions move to and from each other; and

sensing means disposed on the first and second straight tube portions at an intermediate position between the fulcrum means and the other ends of the respective straight tube portions for detecting a relative displacement of the first and second straight tube portions moving to and from each other about the fulcrum means acting as a fulcrum.

4,811,607

FLOW SENSOR

Ronald B. Walters, Wembley, and Peter M. Hamey, Emsworth, both of England, assignors to Vickers Systems Limited, Havant, England

Filed Apr. 20, 1987, Ser. No. 40,244

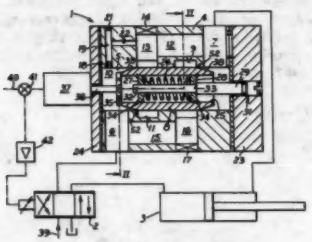
Claims priority, application United Kingdom, Apr. 21, 1986, 8609658; Jun. 3, 1986, 8613394

Int. Cl.[4] G01F *1/22, 1/26*

U.S. Cl. 73—861.53 **12 Claims**

1. A flow sensor comprising a body formed with a cylindrical bore, at least one fluid inlet and one fluid outlet for permitting ingress and egress of fluid to and from the sensor, and a spool slidably mounted within the bore and tapered at either end past which fluid flows from the inlet to the outlet, wherein the spool also has a single spring mounted internally thereof and acting against and between two spaced abutments which are connected to the interior of the spool in such a way that they move with the spool in one direction of movement thereof and slide relative to the spool in the opposite direction of movement thereof, the spool being arranged to close the outlet in the null position of the spool when no fluid flow takes place, and being movable against the action of the single spring

when fluid flow is present, to open the outlet, the extent of movement being representative of the rate of flow of the fluid



and being sensed by sensor means associated with the spool to provide an output also representative of fluid flow.

4,811,608

FORCE AND TORQUE CONVERTER

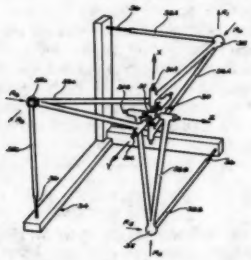
John A. Hilton, Toongabbie, Australia, assignor to Spatial Systems Pty Limited, New South Wales, Australia

Filed Nov. 6, 1986, Ser. No. 927,915

Claims priority, application Australia, Dec. 18, 1985, PH03934

Int. Cl.[4] G01L *5/16*; G05G *9/04*

U.S. Cl. 73—862.04 **18 Claims**



17. Apparatus for transforming applied forces into translational components along three mutually perpendicular axes and torque components about these three axes, the apparatus comprising a body to which the force is applied, three connecting members attached to the body and extending away therefrom such that in a central position of the body remote connection points on the respective connecting members lie along respective reference axes extending from a central point of the body, these reference axes being mutually perpendicular, respective leg means being pivotally connected to the respective connecting members at said connection points through universal joints of limited range and motion, biasing means being provided to bias the connecting members towards the central position, and sensor means for sensing displacement of each connecting member and/or each leg means whereby the nature of the applied force may be determined.

4,811,609

TORQUE DETECTING APPARATUS

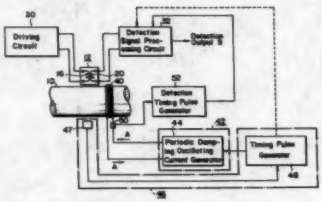
Yuji Nishibe; Yutaka Nonomura, and Masaharu Takeuchi, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed May 11, 1988, Ser. No. 192,621

Claims priority, application Japan, May 12, 1987, 62-115362

Int. Cl.[4] G01L *3/10*

U.S. Cl. 73—862.36 **16 Claims**



1. A torque detecting apparatus comprising:

a magnetic sensor for measuring the amount of magnetostriction of a rotary magnetic material which transmits torque;

a demagnetization coil which is opposed to said rotary magnetic material so as to restore said rotary magnetic material magnetized by a disturbing magnetic field to the state of zero magnetization;

a demagnetization circuit for applying an oscillating current to said demagnetization coil so as to generate in said rotary magnetic material a periodic damping oscillating magnetic field having the maximum value larger than the coercive force of said rotary magnetic material; and

a trigger circuit for outputting a drive timing signal for driving said demagnetization circuit;

whereby transmitted torque is detected on the basis of the amount of magnetostriction of said rotary magnetic material measured by said magnetic sensor without being influenced by a disturbing magnetic field.

4,811,610

WEIGHING CELL

Helmut Gassmann, Seeheim-Jugenheim, Fed. Rep. of Germany, assignor to GTM Gassmann Theiss Messtechnik GmbH, Seeheim-Jugenheim, Fed. Rep. of Germany

Filed Apr. 25, 1988, Ser. No. 186,014

Claims priority, application Fed. Rep. of Germany, May 1, 1987, 3714613

Int. Cl.[4] G01L *1/22*; G01G *3/14*

U.S. Cl. 73—862.65 **7 Claims**

1. A weighing cell comprising

a force introduction element for bearing a load;

a force absorption element spaced from said force introduction element;

an annular deformation body having a height h and a width l, arranged between said force introduction element and said force absorption element;

transducer elements mounted on said deformation body at an axial distance apart for converting mechanical deformation into electrical quantities;

force transmission members connecting said annular deformation body to said force introduction element and said force absorption element respectively, which members comprise annular webs having a mid-plane and a smallest thickness t and a width b wherein

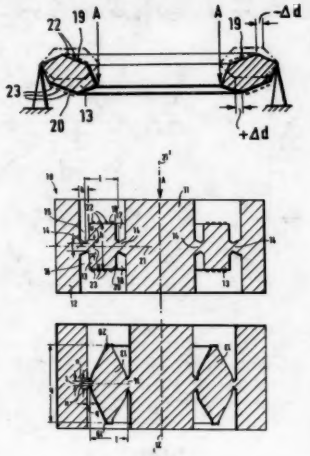
$$t \leqq 1/6\ h$$

and

$$b \leqq \tfrac{1}{4} l$$

when b is measured at a distance u=t from said mid-plane of

the annular web and l is measured between the points of small-



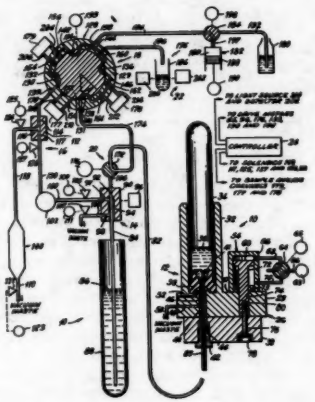
est web thickness.

4,811,611

APPARATUS AND METHOD FOR PRESSURE EQUALIZATION IN CLOSED TUBE SAMPLER

Kenneth F. Uffenheimer, Pelham, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Division of Ser. No. 771,895, Sep. 3, 1985, abandoned. This application May 11, 1987, Ser. No. 49,904
Int. Cl.[4] B01L *3/02*
U.S. Cl. 73—864.22 7 Claims



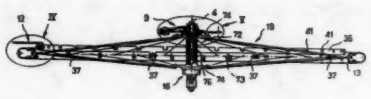
1. In closed tube sampler apparatus which include sample supply means to supply samples from a closed sample container by introducing sample aspiration means comprising a sampling needle thereinto, the improvements comprising, said sample supply means comprising, pressure equalization means operatively connected to said sampling needle and operable upon the introduction of said sampling needle into said closed sample container to equalize the pressure in said closed sample container with ambient atmospheric pressure through said sampling needle prior to sample aspiration, thereby inhibiting vacuum build-up in said closed sample container upon the aspiration of samples therefrom.

4,811,612

METHOD AND DEVICE FOR MEASURING THE TORQUE TRANSMITTED BY THE DRIVING WHEEL OF A CYCLE AND A CYCLE EQUIPPED WITH SAID DEVICE

Jean-Pierre Mercat, Chateau- enault, France, assignor to Ste Look, Nevers, France

Filed Nov. 16, 1987, Ser. No. 121,144
Claims priority, application France, Nov. 19, 1986, 86 16109
Int. Cl.[4] G01L *3/14*
U.S. Cl. 73—862.34 10 Claims



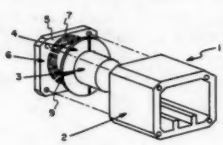
1. A method for measuring the torque transmitted by the driving wheel of a cycle or a mechanical quantity which is a function of said torque, which consists in measuring the angular difference between a driving portion and a driven portion of one of the rotating elements which perform a contributory role in the propulsion of the cycle, wherein the angular difference existing between a central region of the driving wheel and a peripheral region of said wheel is measured by detecting the passage of two separate and distinct series of reference points carried respectively by the central region of the driving wheel and a peripheral region of said wheel and the torque or quantity related thereto is determined by utilizing a predetermined rule of correspondence between the detected difference and the torque.

4,811,613

TWO-AXIS ANGULAR RATE GYROSCOPE

Alan C. Phillips, Los Altos; Terence J. O'Brien, San Jose, and Charles S. Taylor, San Francisco, all of Calif., assignors to Etak, Inc., Menlo Park, Calif.

Filed Sep. 4, 1987, Ser. No. 93,007
Int. Cl.[4] G01C *19/28*
U.S. Cl. 74—5.6 D 3 Claims



1. A two-axis angular rate gyroscopic apparatus comprising:
an electrically conductive rotatable disk, said disk having a central hub portion and a plurality of flexible members, each of which extends from said hub portion and comprises an annular outer portion and a pair of radially extending leg members, said leg members extending from said hub portion;
means for connecting said disk to a source of reference potential;
a plurality of electrically conductive plate members which are mounted on an insulating plate adjacent to said disk;
means for rotating said electrically conductive disk adjacent to said plate members about an axis of rotation; and
electrical circuit means coupled between said plate members and said electrically conductive flexible members of said disk for measuring a change in the capacitance between each of said plate members and said electrically conductive flexible members of said disk when said electrically

conductive flexible members of said rotatable disk undergo precession as said rotatable disk is rotated about an axis perpendicular to said axis of rotation, said change in capacitance being a function of said rate of rotation of said axis of rotation about said axis perpendicular to said axis of rotation.

4,811,614

POWER TAKE-OFF DRIVE UNIT

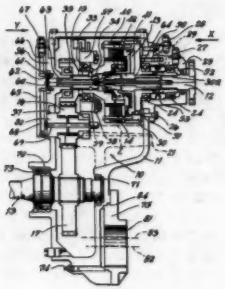
Jean J. Lasoen, Villepreux, France, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Sep. 16, 1987, Ser. No. 97,024

Claims priority, application United Kingdom, Oct. 3, 1986, 8623857

Int. Cl.[4] B60K *17/28, 25/02*; F16D *67/04*

U.S. Cl. 74—15.63 **9 Claims**



1. A power take-off drive unit for use at the front of a tractor, the unit comprising:

a housing;

an input shaft and an output shaft rotatably supported by the housing at different levels;

A gear train within the housing connecting the two shafts;

an oil-cooled clutch within the housing concentric with the higher shaft for connecting/disconnecting drive between the input and output shafts;

means for supplying coolant oil to the clutch, and

a scavenging pump driven from the input shaft for scavenging coolant oil from within the housing to ensure an oil level within said housing below the clutch to minimize the power losses due to churning of the clutch within the coolant oil while still immersing at least part of the gear train.

4,811,615

MECHANISM FOR ELIMINATING GEAR RATTLE IN A SHIFTABLE TRANSMISSION

Jeffrey E. Rea, Yorktown, Ind., assignor to Borg-Warner Automotive, Inc., Troy, Mich.

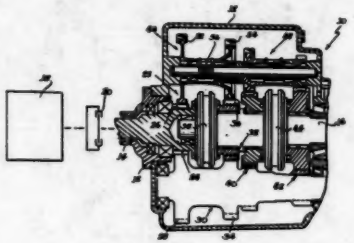
Filed Dec. 14, 1987, Ser. No. 132,504

Int. Cl.[4] F16H *57/12, 3/08*

U.S. Cl. 74—375 **7 Claims**

1. A shiftable transmission with a gear train having a calculatable inertia torque when rotatably driven, said gear train including an input shaft connectable to an engine through a clutch and is therefore subject to torsional acceleration, an output shaft, multiple ratio gearing shiftable into and out of a neutral position and including a driving gear mesh connecting said input shaft to a countershaft and at least one other gear mesh connecting the countershaft to the output shaft, and an operative assembly arrangable in operative combination with said gear train for eliminating gear rattle in any gear ratio and neutral position, said operative assembly comprising:

a shaft separate from said countershaft having a first and a second gear arranged thereon, said first and second gears being axially spaced and engagable with the driving gear mesh and said one other gear mesh, respectively, with a preload means engagably disposed between said first and



second gears for imparting a spring torque to each of said gear meshes, the spring torque of said preload means having a magnitude greater than an inertia torque of either the driving or the one other gear mesh.

4,811,616

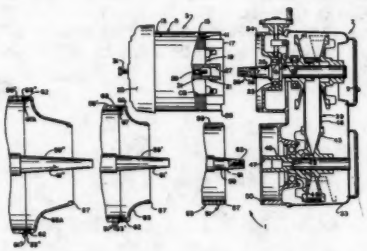
SYSTEM FOR COMBINING DRIVEN MODULES WITH DRIVING MODULES

William R. Henderson, Guilford, Conn., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Apr. 24, 1987, Ser. No. 41,940

Int. Cl.[4] F16H *1/06*

U.S. Cl. 74—421 A **5 Claims**



1. A system of combining any one of a plurality of driving modules with any one of a plurality of driven modules, each of said driving modules having an output shaft, each of said driven modules having an input shaft, one of said shafts of said combined driving module and driven module having a tapered outer surface and the other of said shafts having a tapered socket therein with said tapered shaft being coaxially received within said tapered socket with the taper of said outer surface and the taper of said socket being substantially the same, means for locking said shafts together in coaxial coupled relation, said driving and driven modules each having a respective frame, said frames having respective mating surfaces, means for securing said frames together when said output and input shafts are in coaxial coupled alignment, said driving module and said driven module each having a horsepower rating with the horsepower rating of the driven module being greater than or equal to the horsepower rating of said driving module and with a ratio of said driven module horsepower rating to said driving module horsepower rating being referred to as a service factor, said input shaft of said driven unit being sized so as to be coupled to a driving module when the service factor therebetween is greater than or equal to 1, and an adaptor for use when said service factor is greater than 1, said adapter being circumferentially spaced from said input and output shafts and being interposed between the frame mating surfaces of said driving

module and said driven module so as to positively space said driven and driving modules axially apart a predetermined distance relative to one another dependent on the predetermined service factor of said driving and driven modules and at the same causing said tapered socket to simultaneously and coaxially receive said tapered shaft at a predetermined axial position therealong such that said socket firmly engages said tapered shaft for the transmission of power therebetween.

4,811,617

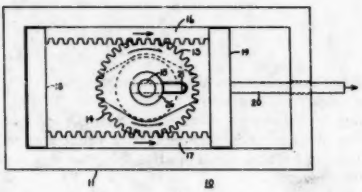
UNIDIRECTIONAL TO BIDIRECTIONAL ANGULAR DISPLACEMENT CONVERSION APPARATUS

Marvin E. Whiteman, Jr., 2254 Braniff St., Boise, Id. 83706

Filed Feb. 1, 1988, Ser. No. 151,212

Int. Cl.[4] F16H *19/04, 21/54, 55/26*

U.S. Cl. 74—422 **10 Claims**



1. An apparatus for converting a unidirectional displacement to an angular displacement of selectable direction which comprises:

a rack gear assembly having two opposing rack gears held in parallel spaced relationship, said rack gear assembly defining a coordinate plane;

a shaft disposed betwewen the rack gears and perpendicular to the coordinate plane of the rack gear assembly;

means for engaging a segmental pinion gear attached to the shaft;

a pair of opposing segmental pinion gears rotatably attached to the shaft, said segmental pinion gears each in cooperative engagement with a corresponding rack gear;

axial moving means for selectively engaging the pinion gear engagement means with either of the two segmental pinion gears.

4,811,618

MOTION CONVERSION MECHANISM

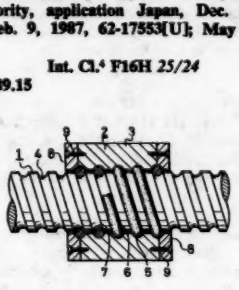
Sui Takayama, Hiratsuka, Japan, assignor to Nippon Gear Co., Ltd. and Atsugi Machinery Co., Ltd., both of, Japan

Filed Jul. 21, 1987, Ser. No. 76,151

Claims priority, application Japan, Dec. 12, 1986, 61-191346[U]; Feb. 9, 1987, 62-17553[U]; May 20, 1987, 62-75335[U]

Int. Cl.[4] F16H *25/24*

U.S. Cl. 74—89.15 **12 Claims**



1. A motion conversion mechanism comprising a threaded shaft and a nut, said nut comprising cylindrical body having the inner surface thereof formed with a groove corresponding to a thread of said threaded shaft, a helical member molded with a material mainly composed of a fluorine resin being closely received in the groove so that it may partly project from the inner peripheral surface of said cylindrical body, the projecting portion of said helical member having a thread to be screwed with the thread of said threaded shaft.

4,811,619

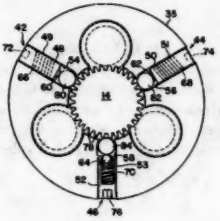
MOTORIZED CONTROL FOR MIRROR MOUNT APPARATUS

Ronald W. Cutburth, Tracy, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 911,843, Sep. 26, 1986, abandoned, which is a continuation-in-part of Ser. No. 759,773, Jul. 29, 1985, abandoned. This application Jun. 6, 1988, Ser. No. 204,944

Int. Cl.[4] F16H *25/20, 57/10*; G05G *5/06*

U.S. Cl. 74—424.8 B **9 Claims**



1. Apparatus comprising:

planetary gear means including a sun gear rotatable about an axis thereof having a first toothed gear surface for generating a rotational force in a first direction, second gear means having a second toothed gear surface responsive to said rotational force for generating a differential driving force substantially perpendicular to said rotational force, and means for selectively rotating said planetary gear means, and

brake means comprising a rotatable detent in the form of a cylinder having a diameter greater than the pitch of the gear of said first toothed gear surface and having an axis parallel to said sun gear axis, said cylindrical detent engaging said first toothed gear surface and being rotatable therewith in either direction about said cylinder axis, and spring means resiliently biasing said cylindrical detent into floating engagement against said first toothed gear surface for permitting rotation thereof by said rotation means and terminating rotation thereof upon cessation of rotation of said rotating means in either direction.

4,811,620

THROTTLE CONTROLS

John L. Old, Kenilworth, England, and Harry Summers, Coventry, United Kingdom, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Jun. 8, 1987, Ser. No. 59,350

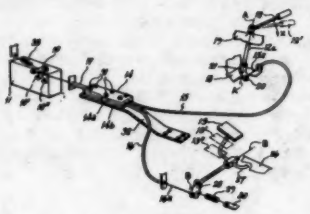
Claims priority, application United Kingdom, Jun. 7, 1986, 8613915

Int. Cl.[4] G05G *9/00, 13/00*; F16C *1/10*

U.S. Cl. 74—474 **6 Claims**

1. A throttle control for a prime mover comprising a prime mover throttle member, a hand control, a foot control, a combining device including a support member and a combining member slidable relative to the support member in first and second opposite directions, first linkage means connecting the combining member with the throttle member so that movement of the combining member in said first direction moves the throttle member towards a fully open position, bias means

acting to bias the throttle member towards an idle position and hence bias said combining member in said second direction via the first linkage means, second linkage means connecting the foot control and combining member for movement of the combining member in said first direction, and third linkage means connecting the hand control with the combining member via a connection capable of moving the combining member



in said first direction only and allowing sliding of the combining member in said first and second directions relative to the third linkage means, the arrangement being such that any throttle member position set by hand control can be increased using the foot control by said second linkage means sliding the combining member in said first direction relative to said third linkage means.

4,811,621

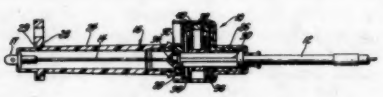
REMOTE CONTROL ASSEMBLY TRANSMISSION SEAL

Arthur L. Spease, Livonia, Mich., assignor to Teleflex Incorporated, Limerick, Pa.

Continuation-in-part of Ser. No. 876,107, Jun. 19, 1986, abandoned. This application Apr. 20, 1987, Ser. No. 40,749

Int. Cl.[4] F16C *1/10*

U.S. Cl. 74—501.5 R **24 Claims**



1. A motion transmitting remote control assembly (10) of the type for transmitting forces along a curved path by a motion transmitting core element, said assembly comprising; a flexible conduit (12) having first and second ends, a flexible motion transmitting core element (14) moveably supported by said conduit (12) with the ends thereof extending from said ends of said conduit (12), housing means (16) having a first end for sealing engagement about an opening in a wall of a fluid reservoir and defining a sealed housing surrounding said core element (14) and extending to a second end thereof, said core element (14) extending through said housing means (16) for extension out of said first end of said housing means and into the fluid reservoir, said first end of said conduit (12) being slideably disposed within said second end of said housing means (16), said assembly (10) characterized by including sealing means disposed between said housing means (16) and said conduit (12) for expanding by swelling in response to fluid contact to prevent fluid flow from the reservoir and about said conduit (12).

4,811,622

FORCE MULTIPLIER

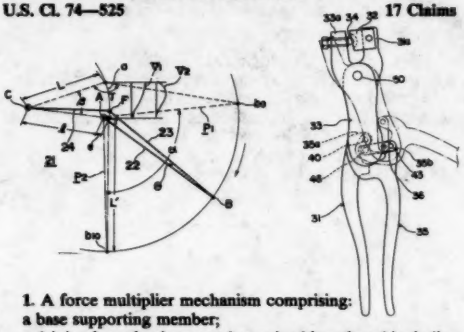
Shichiro Sato, 15-11, Shimooichi Higashimachi, Nishinomiyashi, Hyogo-ken, Japan

Filed Feb. 20, 1986, Ser. No. 831,438

Claims priority, application Japan, Feb. 20, 1985, 60-33156

Int. Cl.[4] G05G *1/04*

U.S. Cl. 74—525 **17 Claims**



1. A force multiplier mechanism comprising:

a base supporting member;

a driving lever having a predetermined length and including a first pivot position separated by a predetermined distance from a second pivot position along the length of said driving lever;

a first pivot for pivotably connecting said first pivot position of said driving lever to said base supporting member;

a driven lever having a predetermined length and including a first pivot position separated by a predetermined distance from a second pivot position along the length of said driven lever;

a second pivot for pivotably connecting said first pivot position of said driven lever to said second pivot position of said driving lever;

a follower pivotably connected to said driven lever at the second pivot position for receiving an increased multiplied force and transmits the force to an additional structure in a device in which the force multiplier mechanism is being utilized, said follower being pivotably supported remote from said second pivot by said driven lever at a distance substantially equal to the distance defined between said first and second pivots; and

a guide for positively guiding the movement of said follower from a first position displaced a predetermined distance from said first pivot, along a continuous substantially radially extending pathway to a point located substantially close to said first pivot, positioning said follower at said point results from movement of said driving lever from a first position through a predetermined angle about said first pivot to a second position pivoting and actuating said driven lever and producing an increase in the multiplied force as said follower is moved to said point located substantially close to said first pivot.

4,811,623

POWER TOOL HANDWHEEL/CRANK

Frank J. Tomiser, Jr., St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

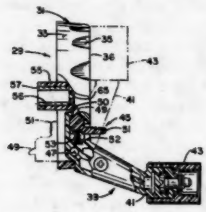
Filed Aug. 17, 1987, Ser. No. 86,308

Int. Cl.[4] G05G *1/00*

U.S. Cl. 74—547 **5 Claims**

1. An adjustment handwheel/crank assembly for a power tool with the later having a base or frame, a component carried by the base or frame which is adjustably moveable relating to the base rotatably driven means for adjustably moving the component with the driven means having a rotary drive shaft, said handwheel/crank assembly rotatably driving said driven means, said handwheel/crank assembly having a hub including an enlarged circular hub body, said hub body having a hub at the center thereof for securely receiving and for positively

rotatably driving said drive shaft, said hub body having a generally circular periphery so constructed as to facilitate the precision manual rotary adjustment of said handwheel/crank assembly, said hub assembly further having a crank handle carried by said hub body with said crank handle being pivotally mounted with respect to said hub body at a position radially offset from said hub, said crank being pivotally movable with respect to said hub body between a folded position in which crank handle is substantially coplanar with the outer



face of said hub body such that a user may readily manually grip said periphery of said hub body substantially without interference from said crank handle for said precision manual adjustment of said component and an extended position in which said crank handle is radially offset from said hub thereby to permit coarse rotary adjustment of said component; said crank having a trunnion extending outwardly therefrom engageable with a selected area of said hub body, and a tab secured to said hub body and resiliently gripping said trunnion so as to resiliently mount said crank on said hub body.

4,811,624

HYDRAULICALLY ACTUATED STROKE ADJUSTING DEVICE

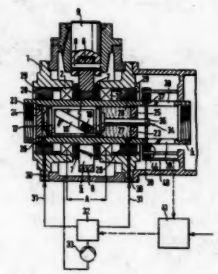
Horst Fritsch, Leonberg, Fed. Rep. of Germany, assignor to Lewa Herbert OTT GmbH & Co., Fed. Rep. of Germany

Filed Feb. 10, 1986, Ser. No. 828,043

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1985, 3505133

Int. Cl.[4] G05G *1/00*

U.S. Cl. 74—571 L **11 Claims**



1. A stroke adjusting device for a oscillating displacement pump, said device comprising an eccentric disk for converting rotary motion of a drive wheel into an oscillating motion of a connecting rod arranged at right angles to said drive wheel; a hollow shaft mounted rotatably but fixed axially in a propulsion mechanism housing, said hollow shaft attached to said drive wheel for rotary motion therewith and attached to said eccentric disk for rotating said eccentric disk said hollow shaft containing a sliding shaft coupled with said eccentric disk via a positioning element slot obliquely inclined to the axis of said sliding shaft, characterized in that an inner portion of said hollow shaft has a portion closed by cylinder covers to define a hydraulic cylinder therien in which the sliding shaft operates as a double action hydraulic piston for displacement of said positioning element along the axis of said hollow shaft, in both directions, by a hydraulic fluid, said displacement adjusting the stroke of one of said oscillating displacement pumps connected to said eccentric disk, the stroke adjusted by shifting said positioning element.

4,811,625

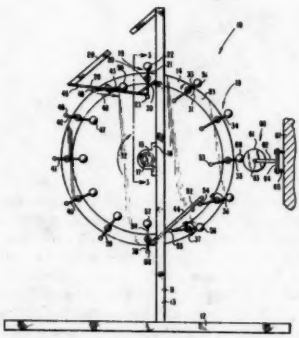
ENERGY CONSERVATOR

James F. Sorg, Elizabeth, and Leo L. Sorg, North Vernon, both of Ind., assignors to J & L Sorg Enterprises, Inc., Elizabeth, Ind.

Filed Sep. 21, 1987, Ser. No. 98,867

Int. Cl.[4] F16F *15/10*

U.S. Cl. 74—572 **5 Claims**



1. A device comprising:

a main frame;

axle means mounted to said main frame;

first flywheel means on said axle means and rotatable in a first direction about a first axis of rotation;

first holding means mounted circumferentially to said flywheel means and operable to direct rotation in a second direction opposite to said first direction and about a plurality of second axis of rotation parallel to said first axis, said plurality of second axis of rotation arranged equidistant from said first axis of rotation defining a circular course;

first guide means positioned adjacent said first holding means and defining a path;

first energy conserving means including a plurality of supports mounted to said holding means, said supports including a plurality of first ends of equal weight and a plurality of second opposite ends engageable with said guide means to follow said path operable to rotate said first ends in said second direction positioning each of said first ends outwardly and then inwardly of said circular course in cyclic fashion per revolution of said flywheel means; and wherein:

said holding means allows rotation of said supports in said second direction and limits movement about said plurality of second axis of rotation; and,

said holding means includes a plurality of clutches mounted at each of said plurality of second axis of rotation limiting rotational movement about said plurality of second axis, said holding means includes adjustment means on said clutches receiving each support to allow each first ends of equal weight to be positioned equal distances from respective of said second axis of rotation.

4,811,626
BICYCLE PEDAL CRANK

Michel Bezin, 42bis, Boulevard Victor-Hugo, 58000 Nevers, France

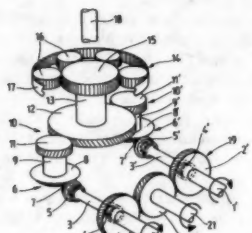
Filed Oct. 23, 1987, Ser. No. 111,934
Claims priority, application France, Oct. 31, 1986, 86 15180; May 6, 1987, 87 06374
Int. Cl.[4] G05G *1/14*
U.S. Cl. 74—594.1 3 Claims

1. A bicycle pedal crank comprising a hollow fiber reinforced synthetic resin tubular crank arm having first and second end pieces at opposite ends thereof, each end piece having a fixing tenon thereon that fits into the associated end of the hollow crank arm and a shoulder surrounding the tenon which extends obliquely with respect to the axis of the crank arm, the crank arm having at each end an oblique end surface disposed obliquely to the axis of the crank arm at the same angle of slope as the shoulder of the corresponding end piece, and means bonding together the crank arm and the first and second end-pieces.

4,811,627
MAIN TRANSMISSION GEARBOX FOR A TWIN-ENGINED HELICOPTER

Rene L. Mouille, Aix-en-Provence, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Jul. 24, 1985, Ser. No. 758,248
Claims priority, application France, Aug. 6, 1984, 84 12400
Int. Cl.[4] F16H *37/06*
U.S. Cl. 74—665 L 15 Claims



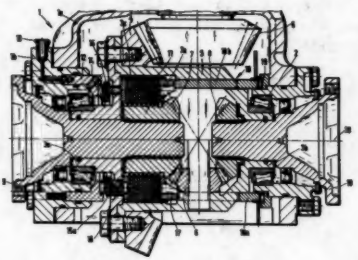
1. A main transmission gearbox for a helicopter having a lifting rotor, an anti-torque rotor and two engines each of which has an output shaft, said gearbox comprising:

a vertical driving shaft for coupling to said lifting rotor, two main kinematic chains for coupling the respective engines to the vertical driving shaft, each main kinematic chain comprising an input stage having an input shaft arranged to be driven in rotation by the output shaft of the associated engine, a first reduction stage having a first transmission shaft driven in rotation by said input shaft, a first bevel pinion driven by said first transmission shaft, a second bevel pinion meshing with said first bevel pinion and a second transmission shaft driven by said second bevel pinion, and a second reduction stage including a third pinion driven by said second transmission shaft and a gearwheel which meshes with said third pinions of both of said main kinematic chains and which is coupled to said vertical driving shaft and a third kinematic chain comprising a train of gears further coupling the two main kinematic chains together, said train of gears comprising an input pinion mounted on and for rotation with said input shaft of each main kinematic chain and at least one intermediate pinion disposed between and in geared connection with said input pinions to couple said input pinions together, each of said first transmission shafts extending between said first bevel pinioin and said input pinion and being flexible in a torsion, said at least one intermediate pinion directly driving a drive shaft of said anti-torque rotor.

4,811,628
LOCKABLE DIFFERENTIAL GEAR

Gamjad Winkam, Zolling, and Manfred Lommerzheim, Neufahrn, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 23, 1987, Ser. No. 111,633
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1986, 3636175
Int. Cl.[4] F16H *1/44;* F16D *25/08*
U.S. Cl. 74—710.5 9 Claims



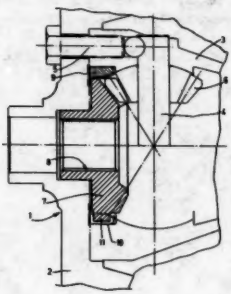
1. A lockable differential gear for motor vehicles, comprising transmission housing means, differential housing means rotatably supported in the transmission housing means; a lamellae set arranged in the differential housing means which is operable to be acted upon from the outside with a locking force; the activated lamellae set being supported at the transmission housing means by way of axial bearing means; a transmission member engaging into the differential housing means is arranged between the lamellae set and a portion of said axial bearing means; and

wherein the transmission member includes a circular ring placed over an external guide means of the differential housing means, the circular ring abutting with its one end face at a portion of said axial bearing means and the other end face thereof passing over into forked-shaped axial arms engaging into the differential housing means and cooperating with the lamellae set.

4,811,629
DIFFERENTIAL LOCKING DEVICE

Félix Mosquin, Villeurbanne, and Bernard Condamin, Lyon, both of France, assignors to Renault Vehicules Industriels, Lyon, France

Continuation of Ser. No. 445,718, Nov. 30, 1982, abandoned. This application Jul. 22, 1985, Ser. No. 757,912
Claims priority, application France, Nov. 30, 1981, 81 22364
Int. Cl.[4] F16H *1/44*
U.S. Cl. 74—710.5 2 Claims

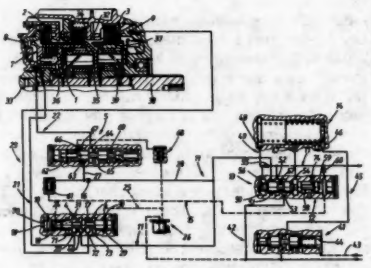


1. A friction-based device for partial locking of a motor vehicle differential with a friction means interposed between at least one bevel gear of the differential and a crown gear connected to a vehicle engine and comprising at least one open elastic segment completely open along a portion thereof to define a slot having two opposing radially extending end faces and contained under compression in a bore in a differential housing, said at least one segment exerting radial pressure on the inside surface of the bore, and a lug rotationally connecting the at least one segment to the corresponding bevel gear, said lug radially protruding into the slot of said at least one open elastic segment with lateral clearance, the lug being integrally welded with the corresponding bevel gear.

4,811,630
AUTOMATIC SHIFT DEVICE FOR AN EPICYCLIC CHANGE-SPEED GEAR HAVING MEANS FOR BLOCKING THE ENGAGEMENT OF A REVERSE GEAR CLUTCH AND/OR REVERSE GEAR BRAKE

Klaus Heber, Remseck, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 29, 1988, Ser. No. 162,087
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1987, 3710080
Int. Cl.[4] F16H *5/00*
U.S. Cl. 74—752 A 12 Claims



1. Automatic shift device of an epicyclic change-speed gear transmission having a forward gear clutch for a least one forward gear to provide a forward drive and a reverse gear clutch and a reverse gear brake to control a reverse gear for a rearward drive, which clutches and brakes are engaged by associated shift control means connected respectively to a switch valve means and blocking means to inhibit the engagement of at least one of the reverse gear clutch and reverse gear brake when the forward gear clutch is engaged with a blocking control means responsive to a blocking pressure, whereby the associated shift control means is lockable in a position disengaging the reverse gear brake, comprising:

a forward gear work pressure mans providing a forward work pressure line to engage the forward gear clutch and used as a blocking pressure;

said shift control means being connected to a system pressure line includes first and second shift valve means for engaging said reverse gear clutch and reverse gear brake respectively, as well as the shift valve means for engaging the forward speed clutch and the disengaging of the respectively associated reverse clutch or brake synchronously by a control pressure determined by a solenoid control valve means;

said shift valve means of the reverse gear clutch being connected through a throttle to said system pressure line, the pressure of which can be regulated to a reduced pressure value through a valve control element means of a hydraulic time element means; said time element means including a receiver connected to a regulator valve;

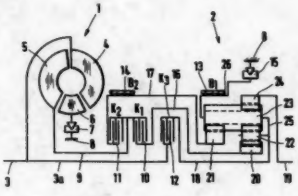
said valve control element means communicating through a control pressure line with a section of said system pressure line located between said throttle and said shift valve means of the reverse speed clutch; and

wherein the shift valve means of the forward gear clutch communicates with another section of the system pressure line between said throttle and said receiver.

4,811,631
SHIFTING METHOD FOR HYDRODYNAMIC-MECHANICAL TRANSMISSION

Ernst-August Honig; Lothar Kaspar; Manfred Kalversberg, all of Wolfsburg; Gerd Oberpichler, Braunschweig; Gottfried Hagemann, Wolfsburg, and Dieter Schmidt, Gifhorn, all of Fed. Rep. of Germany, assignors to Volkswagen Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jun. 3, 1986, Ser. No. 869,995
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1985, 3522184
Int. Cl.[4] F16H *57/10, 47/08*
U.S. Cl. 74—762 4 Claims



1. A method for shifting a motor vehicle transmission having a hydrodynamic torque converter and a planetary gear transmission, the torque converter including a pump rotor connected to a motor shaft and a turbine rotor, said gear transmission including a first sun gear connectable to said turbine rotor by a first clutch, a second sun gear connectable to said turbine rotor by a second clutch, a planetary mount connectable to said pump rotor by a third clutch, bypassing said torque converter, a first planet gear mounted on said mount and engaging

said first sun gear, a second planet gear mounted on said mount and engaging said second sun gear, said first planet gear, and an internal gear connected to a power output shaft, wherein said gears and clutches are arranged to provide a direct drive transmission gear ratio either by engagement of the first and second clutches, or by engagement of the first and third clutches, or by engagement of the second and third clutches, or by engagement of the first, second and third clutches, said method comprising the sequential steps of:

responsively to said transmission automatically shifting from second gear to said direct drive, regardless of operating speed of the vehicle, setting a first clutch condition for said direct drive transmission ratio in which said first and second clutches are engaged and said third clutch is disengaged, for providing a hydrodynamic torque transmission path including said torque converter;

responsively to the traveling speed of the vehicle exceeding a first predetermined speed, automatically setting a second clutch condition for said direct drive transmission ratio in which said first, second and third clutches are engaged, for providing a mechanical torque transmission path which at least partially bypasses said torque converter,

said first and second clutch conditions thereby providing the same direct drive transmission ratio with different torque transmission paths; and

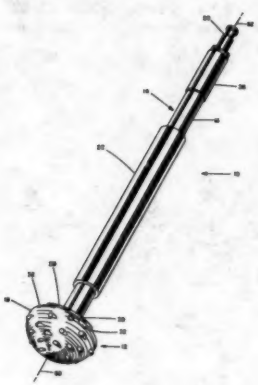
responsively to the traveling speed of the vehicle approaching a speed at which the transmission automatically upshifts to fourth gear from said direct drive transmission ratio automatically setting a third clutch condition for said direct drive transmission gear in which said third clutch and one of said first and second clutches are engaged, for providing one of first and second branched train torque transmission paths each of which partially bypasses said torque converter, said transmission upshifting to fourth gear only when said clutches are in said third clutch condition.

4,811,632

METHOD OF PRODUCING AN ACETABULAR REAMER CUP

Paul E. Salyer, Warsaw, Ind., assignor to Othy, Inc., Warsaw, Ind.

Filed Feb. 4, 1986, Ser. No. 825,992
Int. Cl.[4] B21K *21/00*; B23D *73/04*
U.S. Cl. 76—101 A **16 Claims**



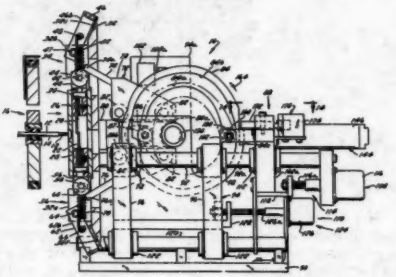
1. A method for making an acetabular reamer cup for an acetabular reamer comprising the steps of: fabricating a bowl-shaped cup-blank having outer and inner bowl-shaped surface, perforating a plurality of holes through said cup-blank, said holes each being surrounded by a curved margin, deforming outwardly of one of said surface a cutting portion of said margin of each of said holes, said cutting portions being curved outwardly of said one surface, smoothing said one surface of said cup-blank to sharpen said cutting portions, and raising curved cutting edges from said cutting portions outwardly of said one surface, said cutting edges also being curved tangentially of said one surface and disposed to cut upon rotation of said acetabular reamer.

4,811,633

ADJUSTABLE WIRE STRIPPING APPARATUS

David M. Bueschel, Menomonee Falls, and Kenneth A. Wollermann, Mukwonago, both of Wis., assignors to Artos Engineering Company, New Berlin, Wis.

Filed Feb. 1, 1988, Ser. No. 151,013
Int. Cl.[4] H02G *1/12*
U.S. Cl. 81—9.51 **8 Claims**



1. A programmable apparatus for automatically stripping insulation from a wire end being conveyed by a wire conveyor, thereby leaving a portion of exposed conductor, comprising:

A. insulation cutting means for transversely cutting said insulation to provide a cut portion of insulation, including of said blades being movable toward the other by blade closing means to effect transverse cutting of said insulation;

B. insulation moving means for axially moving said cut portion of insulation relative to said conductor to effect stripping, including means for moving said cutting means toward said wire end and positioning said wire end between said blades, and for moving said cutting means away from said wire end after said blades have been closed on said wire end and said insulation has been cut, for effecting stripping of said wire end;

C. depth control means for controlling the depth to which said cutting means cuts said insulation; and

D. length control means for controlling the length of said cut portion; means including:

E. said means for moving said cutting

(1) a blade holder for holding said cutting blades in position, means and

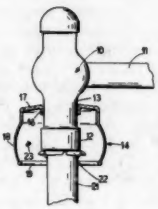
(2) slider means connected to said holder slidably engaged in a support frame connected to said conveyor, by first

(3) cam means connected to said slider means cam follower means and rotatably connected to said support frame for moving said slider means and thus said blade holder to any one of a number of predetermined positions as required to effect stripping of said wire end, and

(4) prime mover means for rotating said cam means within said support frame, said cam means includes a cam disk having on one side thereof a first cam surface, said cam disk being rotatably attached to said support frame, and said first cam follower means being adapted to follow said first cam surface, said depth control means includes means for shifting said cam follower means with respect to said slider means, said shifting means includes a servo motor which is affixed between said cam follower

means and said slider means, said servo motor having a drive shaft, said drive shaft being threaded and connected such that, when said drive shaft is caused to rotate by said servo motor, said slider means is shifted with respect to said cam follower means.

4,811,634
HAMMER HAT
Michael Tauber, 1908 S. Ashland Ave., Park Ridge, Ill. 60068
Filed Aug. 3, 1987, Ser. No. 80,861
Int. Cl.[4] B25C *1/00*
U.S. Cl. 81—21 **5 Claims**

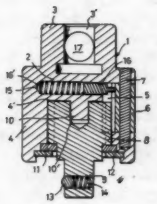


1. A protective guard for a hammer comprising, a cup-shaped member which is larger than the head of the hammer and which is formed with a top member formed with an opening through which the head of the hammer can be inserted and downwardly extending flexible sidewalls which extend beyond the end of the head of the hammer so as to form a fragment catching pocket for fragments which fly from a workpiece as it is struck by said hammer, and wherein a collar is formed around said opening from which pins extend and a flexible strip attached to said collar and wrapable around the shank of hammer and formed with openings through which said pins can be inserted to lock said guard to said hammer.

4,811,635
POWER TONG IMPROVEMENT
Thomas E. Falgout, Sr., Rte. 2, Box 11B, Youngsville, La. 70592
Filed Sep. 24, 1987, Ser. No. 100,528
Int. Cl.[4] B25B *13/50*
U.S. Cl. 81—57.33 **3 Claims**

1. An improved powered pipe tong comprising:
(a) a pipe tong frame having a generally central opening to receive pipe to be rotated;
(b) a drive ring mounted on said frame and arranged for rotation around an axis extending through said opening;
(c) pipe gripping means mounted on said drive ring arranged to releasably grip pipe extending through said opening;
(d) power means mounted on said pipe tong frame and arranged to rotate said drive ring;
the improvement comprising:
(e) force means mounted on said frame and arranged to extend at least one force member toward said drive ring in response to fluid power applied to said force means from an external fluid power source, said force member retractable to clear said drive ring to permit drive ring rotation;
(f) force transfer means mounted on said drive ring, arranged to receive force from said force member and to apply force to said pipe gripping means to grip pipe;
(g) lock means mounted on said drive ring and arranged to releasably lock said pipe gripping means in position when said pipe gripping means is in pipe gripping position.
(h) side openings in said pipe tong frame and in said drive ring through which pipe to be rotated can be moved into and out of the tong; and
(i) said pipe gripping means comprising three pipe gripping dies mounted on said drive ring, two of which pivot between first open positions to clear said side opening and second closed positions to grip pipe, about pivot pins mounted on said drive ring, and a third die situated opposite said side opening in said drive ring and arranged to move radially between a first open position to clear pipe and a second closed position to grip pipe.

4,811,636
RATCHET DEVICE ADAPTABLE TO VARIOUS SCREW-ROTATING TOOLS
Masahiko Okura, 11-7, 4-chome, Siroganedai, Minatoku, Tokyo, Japan
Filed Apr. 7, 1988, Ser. No. 178,919
Int. Cl.[4] B25B *13/76*
U.S. Cl. 81—63.2 **1 Claim**



1. A ratchet device for driving a rotatable tool, comprising
a body having an upper portion and a lower portion,
said upper portion having a top part comprising at least three outer wide walls extending from said lower portion, a hollow hole having at least three inner side walls and an axis, and a penetrating circular bore extending at right angles to said axis of said hollow hole,
said lower portion having a hollow part and a cut-out part;
a partition plate disposed between said hollow part of said lower portion and said hollow hole of said upper portion, and having a hollow cylindrical cavity, said hollow cylindrical cavity having an axis perpendicular to an axis of a ratchet wheel;
a pawl disposed in said cut-out part and movable to a first position to enable said ratchet wheel to turn in one direction, and to a second position to enable said ratchet wheel to turn in another direction, and accessible for manual movement to said first and second positions;
said ratchet wheel being disposed in said hollow part of said lower portion and engageable with said pawl;
a projecting portion having a part extending from and rotatable with said ratchet wheel and having the same axis as said ratchet wheel: and
a pin member disposed in said hollow cylindrical cavity of said partition plate and movable in a direction perpendicular to said axis of said ratchet wheel against said pawl to prevent reversal of said ratchet wheel,
so that the upper portion is drivable by different types of hand tools holding the outer side walls, the inner side walls or the bore of the top part of the upper portion, and the projecting portion is insertable into a rotatable tool,

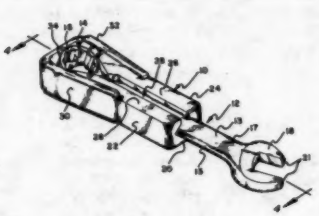
and rotation of the device by one of the different types of hand tools causes rotation of the projecting portion in one or another direction depending on the manually set position of the pawl, with the pin member acting against the pawl to prevent reverse direction rotation of the ratchet wheel.

4,811,637

PROTECTION DEVICE FOR HAND WRENCHES

Ronald T. McCleary, 15 Indian Springs Rd., Clementon, N.J. 08021

Filed May 12, 1988, Ser. No. 192,939
Int. Cl.[4] B25B *13/00*
U.S. Cl. 81—177.2 **12 Claims**



1. A detachable hand protection device to interfit on hand wrenches having nut or bolt head engaging means to engage either a nut or bolt head on each end of a wrench body member having a top, a bottom, and two sides, the device comprising an integral elastomeric molding comprising:

(a) a jacket enclosing a sufficient portion of the wrench body provide a grip for the hand comprising:

(i) a bottom wall member enclosing and opposed to the bottom of the wrench body member,

(ii) two side wall members extending upwardly from the bottom wall having interior opposing wall surfaces of sufficient size and shape to grip the sides of the wrench body member, and

(iii) a top wall member partially enclosing the wrench body member top having a longitudinally cut slot opening of sufficient size and shape to receive and release the wrench body member,

(b) two side wall extension members, one each extending longitudinally from a side wall member of a size and shape to extend to an outer end of the nut or bolt head engaging means covering the side edges of that nut or bolt head engaging means, and

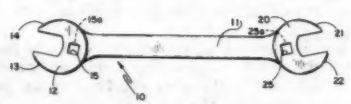
(c) and end wall connecting the side wall members proximate to and covering the end of the nut or bolt head engaging means.

4,811,638

TORQUE TOOLS

Ernst Kertzscher, 21350 Olinda Trail North, Scandia, Minn. 55073

Filed Apr. 25, 1988, Ser. No. 185,887
Int. Cl.[4] B25B *23/16*
U.S. Cl. 81—177.2 **3 Claims**



1. A wrench for use in a conventional manner of tightening or loosening fasteners and for use with a socket drive mechanism to provide additional leverage to permit the user to provide greater torque than the user can generate through application of hand force on the wrench comprising:

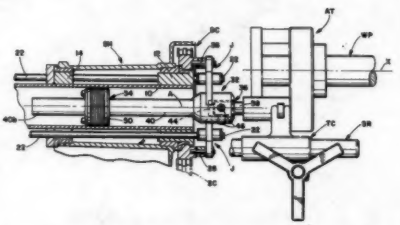
a wrench having a first head, a second head and a handle, said handle having a first end and a second end, said first end of said handle connected to said first head and said second end of said handle connected to said second head, said first head, said second head and said handle lying substantially in a plane, said first head including a hardened area with a first pair of jaws located in said hardened area of said first head, said first pair of jaws operable for engaging a fastener to permit a user to apply a torque to the fastener by applying a force to said handle, said second head including a hardened area with a second pair of jaws located in said hardened area of said second head, said second pair of jaws operable for engaging a fastener to permit a user to apply a torque to a fastener by applying a force on said handle, said first head including a first socket drive opening to receive a socket drive mechanism to permit a sure to increase the leverage on said wrench and to position a socket drive mechanism in a suitable position, said first socket drive opening located in said hardened area of said first head, said first socket drive opening located flush with said first head so as not to interfere with use of said wrench without a socket drive mechanism, said second head including a second socket drive opening to receive a socket drive mechanism to permit a user to increase the leverage on said wrench and to position a socket drive mechanism in a suitable position, said second socket drive opening in said second head located in said hardened area of said second head, said second socket drive opening in said second head located flush with said second head so as not to interfere with use of said wrench without a socket drive mechanism so that either said first pair of jaws or said second pair of jaws of said wrench can be used in a conventional manner to loosen or secure a fastener or can be used with a socket drive mechanism to provide a longer lever arm to enable the user to increase the torque on a fastener without the user having to increase the hand force.

4,811,639

DRIVE BAR ATTACHMENT FOR THREADING MACHINES

Paul W. Gress, Bay Village, and Paul E. Wesebaum, Elyria, both of Ohio, assignors to Emerson Electric Co., St. Louis, Mo.

Filed Feb. 22, 1988, Ser. No. 158,889
Int. Cl.[4] B23B *1/00*
U.S. Cl. 82—110 **18 Claims**



1. In combination, a power driven threading machine of the character having rotatable tubular spindle means for receiving a workpiece and having a spindle axis and axially opposite ends, jaw means supported on said spindle means adjacent one of said ends for rotation therewith about said spindle axis and for displacement radially inwardly and outwardly of said spindle axis respectively into workpiece gripping and workpiece releasing positions relative to a workpiece in said spindle means, drive means for displacing said jaw means between said positions thereof, said drive means and jaw means in said

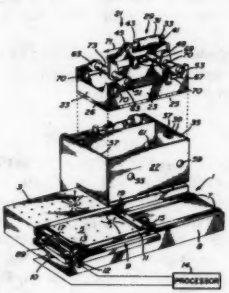
workpiece gripping and releasing positions respectively rotating said workpiece and spindle means in one direction about said spindle axis and rotating said spindle means in the opposite direction about said spindle axis, and an attachment comprising support means receivable in said spindle means coaxial with said spindle axis and having outer end means engaged by said jaw means in said workpiece gripping position thereof for said drive means and jaw means to rotate said attachment and spindle means in said one direction, clutch means on said support means having clutching engagement with said spindle means when said drive means and jaw member means rotate said spindle means in said opposite direction whereby said spindle means rotates said attachment in said opposite direction, and said outer end means including power output coupling means.

4,811,640

METAL SHEARING MACHINE

Rudy Fritsch, 7395 David Laurent, Rivière des Prairie, Quebec, Canada H1E 3L5

Filed Mar. 14, 1988, Ser. No. 168,143
Int. Cl.[4] B25D 7/02
U.S. Cl. 83—13 **8 Claims**



1. A method for precisely and accurately aligning a workpiece in a desired position under the shearing blades of a metal shearing machine, said metal shearing machine comprising: a movable carriage means for carrying said workpiece, said movable carriage means being movable in a first direction by a first drive means; a gripper arrangement comprising two spaced finger grippers connected by a connecting bar, said gripper arrangement being movable in a second direction, transverse to said first direction, along the top surface of said movable carriage by a second drive means; a processor providing actuating signals to said first and second drive means and receiving feedback signals from said first and second drive means indicative of distance moved by said movable carriage in said first direction and by said gripper arrangement in said second direction; sensor means in each of said finger grippers to sense when the workpiece is in the finger gripper, the output of the sensor means being fed to said processor; each finger gripper including control means for effecting gripping of the workpiece when the workpiece is in the finger gripper, the control means being actuatable by said processor; said movable carriage being movable along the tracks from one end to the other end of a track bed, a lateral sensor being disposed at the one end of the track bed, the output of the lateral sensor being fed to said processor;

said method comprising:

inputting the dimensions of said workpiece into said processor;

inputting the dimensions of the desired position of the workpiece under said shearing blades into said processor;

inputting the dimensions of the position of said lateral sensor into said processor;

laying said workpiece on the top surface of said movable carriage in a random position;

said processor causing said second drive means to move said gripper arrangement in said second direction until the sensor means of one finger gripper senses that the workpiece is in said one finger gripper;

said processor continuing to cause said second drive means to drive said gripper arrangement in said second direction until the sensor means of said other finger gripper senses that the workpiece is in the second finger gripper;

said processor ceasing to cause said second drive means to drive said gripper arrangement;

said processor recording the position of said gripper arrangement on the cessation of the second drive means;

said processor actuating the control means of said first and second finger grippers to grip said workpiece;

said processor causing said first drive means to move said movable carriage towards said lateral sensor along said one direction until said lateral sensor senses the presence of said workpiece, whereupon the position of said movable carriage in said one direction is available to said processor;

said processor ceasing to cause said first drive means to drive said movable carriage;

said workpiece now being in a start positron;

said processor, using the dimensions of said start position and said desired position, calculating the number of units the carriage must be moved in the first direction and the gripper arrangement must be moved in the second direction to place the workpiece in the desired position;

said processor causing said first drive means to move said movable carriage the calculated number of units in the first direction and the second drive means to move the calculated number of units in the second direction;

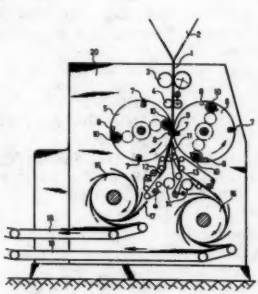
whereupon, said workpiece underlies said shearing blades in said desired position.

4,811,641

APPARATUS FOR CUTTING AND DIVIDING A CONTINUOUS STREAM OF PRINTED PRODUCTS

Hans Müller, Leimen, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

Filed Oct. 28, 1987, Ser. No. 114,416
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1986, 3637110
Int. Cl.[4] B26D 7/06
U.S. Cl. 83—105 **20 Claims**



1. An apparatus for cutting and dividing a continuous stream of printed product, said apparatus comprising:

a first rotatable cylinder and a second rotatable cylinder, each having means for cutting said continuous stream of printed product into a given length, and each cylinder being disposed to draw said continuous stream of printed product therebetween in use, both said cylinders having at least one cutting blade and at least one rubber strip disposed in each of said cylinders;

means for aligning each cutting blade of each of said cylinders with a corresponding rubber strip of the other of said cylinders during rotation of said cylinders for cutting said printed product;

diverter means disposed in each said cylinder for directing leading edges of printed product being cut;

said diverter means in said first cylinder being disposed to direct leading edges of a first cut portion of said printed product in a first printed product path; and

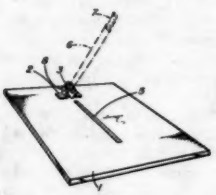
said diverter means in said second cylinder being disposed to direct leading edges of a second cut portion of said printed product in a second printed product path.

4,811,642

KITCHEN GUILLOTINE

Charles Sorbie, 208, Alwington Place, Kingston, Ontario, Canada (K7L 4P8)

Filed Oct. 1, 1987, Ser. No. 103,396
Int. Cl.[4] B26D *3/24*
U.S. Cl. 83—574 **2 Claims**



1. A kitchen slicer board comprising:

(a) a flat base plate having an upper surface and first and second ends;

(b) cylindrical means mounted perpendicularly by means of a flange at the lower end thereof in guide means on the base plate adjacent said first end for rotation about its longitudinal axis and

(c) means on said upstanding cylindrical means arranged to slidably receive a tip of a selected knife blade therein for pivotal movement of the knife blade about an axis parallel and upper surface, and

(d) lock means comprising a pivotable member mounted on said guide means and arranged to engage said cylindrical means so as to releasably lock said cylindrical means in said guide means at selected ones of a plurality of rotational positions.

4,811,643

GUIDE FOR HAND MANIPULATED POWERED CUTTING TOOLS

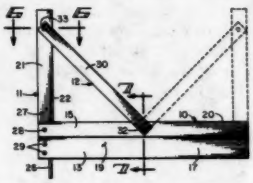
George A. Krieger, 1103 S. 43rd Ave., Yakima, Wash. 98908

Filed Jan. 25, 1988, Ser. No. 147,536
Int. Cl.[4] B27B *9/04*
U.S. Cl. 83—745 **1 Claim**

1. A guide structure for a manually manipulated powered tool on a work piece, comprising, in combination:

an elongate guiding blade structure for positioning on a work piece with an elongate friction element on its lower surface immediately inwardly adjacent a first outer edge, and a guide element on its upper surface defining a tool supporting channel extending inwardly from the outer edge, said guide element being relatively narrow to define an elongate ridge to slidably support a jig carried by a powered tool to maintain lateral position of that powered tool relative to the guiding blade; and

a head at one end of the guiding blade extending perpendicularly rearwardly from the first outer edge of the blade and depending a spaced distance therebelow, said head defining a channel parallel to and immediately adjacent its blade facing edge releasably carrying an indicating element extending outwardly a spaced distance from the first



forward edge of the blade and adapted to be cut by a cutting tool guided by said blade said head structure being releasably attachable to said guiding blade at either end of the guiding blade to allow use of a cutting tool having a cutting element on either side of a running guide element; and

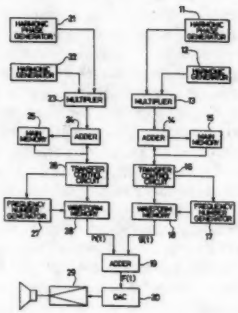
support means releasably communicating between said blade structure and said head to aid rigidity between and positional integrity of said elements.

4,811,644

ELECTRONIC MUSICAL INSTRUMENT FOR GENERATION OF INHARMONIC TONES

Tadashi Matsushima, Shizuoka, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan

Continuation of Ser. No. 831,661, Feb. 20, 1986, abandoned.
This application Nov. 25, 1987, Ser. No. 129,423
Claims priority, application Japan, Feb. 26, 1985, 60-037282
Int. Cl.[4] G10H *1/08, 7/00*
U.S. Cl. 84—1.2 **4 Claims**



3. An electronic musical instrument which synthesizes a musical waveform having inharmonics by computing each harmonic function and each phase function corresponding to a fundamental wave, comprising:

(a) harmonic function generating means for generating harmonic functions sin $K\omega_0 t$ and cos $K\omega_0 t$, where K is an integer from 1 to n, n being an arbitrary integer, ω_0 is the fundamental wave and t is time;

(b) means for reading out the harmonic functions from the harmonic function generating means;

(c) phase function generating means for generating phase

functions cos $\Delta\omega_K t$, where $\Delta\omega$ is an arbitrary frequency which differs from the frequency of the fundamental wave;

(d) means for reading out the phase functions from the phase function generating means;

(e) harmonic coefficient generating means for generating harmonic coefficients;

(f) main register means for storing transfer data;

(g) multiplying means for multiplying together the harmonic functions from the harmonic function generating means, the phase functions from the phase function generating means and the harmonic coefficients from the harmonic coefficient generating means;

(h) adder means for adding the multiplied output from the multiplying means and data in the main register means, said register receiving data from said adder, said adder means for multiplying the added output from said main register means by the next multiplied output from said multiplying means;

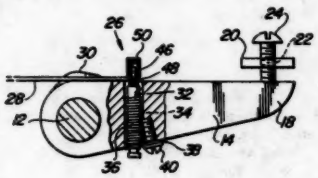
whereby it is possible to synthesize a musical waveform which has harmonics corresponding to the fundamental wave and inharmonics, each having the arbitrary frequency difference ($\Delta\omega_K$) from the corresponding one of the harmonics.

4,811,645

TUNING MECHANISM FOR STRINGED INSTRUMENT

Larry E. Cummings, 88056 Grand View Dr., Springfield, Oreg. 97478

Filed Feb. 4, 1988, Ser. No. 152,201
Int. Cl.[4] G10D *3/14*
U.S. Cl. 84—207 **3 Claims**



1. For use with a stringed instrument having a support, fine-tuning mechanism comprising a horizontal shaft carried by the support, arm having a rear end carried by the shaft and projecting forwardly and substantially horizontally as a radius of the shaft to a front terminal end, said arm having vertical through bore intermediate its ends, a stud received in the bore for turning about the bore axis and having upper and lower ends projecting respectively above and below the upper and lower portions of the arms, said upper end being formed with a slot therein for receiving a string trained over and extending rearwardly from the arm, a coil spring sleeved over and having a frictional fit with the stud and dimensioned to fit within the bore, said spring having a lower end projecting at the lower end of the stud, and means securing the lower end of the spring to the arm whereby the stud is capable of one-way turning in the bore for tensioning the spring.

4,811,646

HOLDING STRUCTURE FOR THE TREMOLO OF A GUITAR

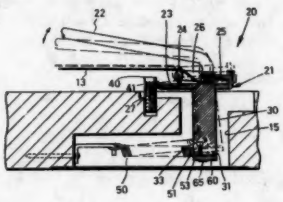
Yoshihiro Hoshino, Nagoya, Japan, assignor to Hoshino Gakki Co., Ltd., Japan

Filed Oct. 20, 1987, Ser. No. 110,333
Claims priority, application Japan, Jun. 25, 1987, 62-97889
Int. Cl.[4] G10D *3/12*
U.S. Cl. 84—313 **2 Claims**

1. A tremolo device for a guitar wherein the guitar has a body, an opening defined in the body; a bridge disposed above the body surface, means for hingedly mounting the bridge for rotation in a plane perpendicular to the surface of the body of a guitar; the bridge having a tail piece for attachment thereto of guitar strings; a hanging part carried by the bridge tail piece, the hanging part having a lower end which is received in and movable in the opening in the body; a tremolo arm on the bridge operable to rotate the bridge on the hinge means;

a tension spring between the guitar body and the hanging part;

a connection between the tension spring and the lower end



of the hanging part; the connection comprising a hook at the end of the spring; the spring having a neck behind the hook;

a receiver opening into the lower end of the hanging part and the hook extending into the receiver opening;

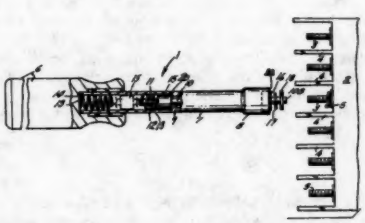
securement means for securing the neck of the attachment piece against the underside of the lower end of the hanging part; wherein the securement means comprises a compression plate for holding the neck to the hanging part and means for fixing the compression plate against the hanging part.

4,811,647

NUT AND WASHER RETAINER AND DRIVING TOOL

David M. Lindamood, 7293 Forsythia St., Springfield, Oreg. 97478

Filed May 4, 1987, Ser. No. 45,417
Int. Cl.[4] B25B *13/02*
U.S. Cl. 81—125 **4 Claims**



1. A tool for placing a washer and starting a nut element on a threaded shaft and driving the nut element, said tool comprising, a socket for rested retention of the nut element and subsequently imparting torque to the nut element,

a tubular shaft extending rearwardly from said socket and defining a lengthwise bore in communication with the interior of said socket, means for imparting torque to said tubular shaft,

an elongate pin slidably and centrally disposed in said bore and having a forward segment normally projecting through said socket and freely through a nut element when in said socket and projecting forwardly from said socket,

spring means biasing said pin forwardly to enable the manual placement of a washer on the pin forward segment,

washer being held manually on pin by operator for less than horizontal position of nonmagnitized pin, or magnitized or nonmagnitized pin placing nonferous washers,

said elongate pin being rearwardly displaceable upon endwise contact with the outer end of the threaded shaft causing the washer to be transferred onto the threaded shaft for subsequent advancement therealong by socket rotation of the nut element.

4,811,648

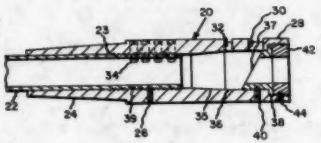
MUZZLE BRAKE DEVICE

David L. Blackwell, Rte. 1, Lot 14, and Paul E. Stratton, Jr., 155 Unger St., both of Gnadenhutten, Ohio 44629

Filed Sep. 14, 1987, Ser. No. 96,061

Int. Cl.[4] F41F *17/12*

U.S. Cl. 89—14.3 **12 Claims**



1. A muzzle brake device for a gun comprising in combination:

a housing;

means for securing said housing at the end of the gun's barrel; and

a strike plate, wherein said housing includes therein a truncated conical expansion chamber having an annular surface in the shape of a horizontal, hollow, truncated cone, the base or muzzle end of which defines the transverse cross-sectional area of a cylindrical passageway also contained in said housing, and the truncated top or breech end of which defines the transverse cross-sectional area of the barrel bore of said gun, said strike plate being disposed in the cylindrical passageway at the muzzle end of said expansion chamber and having an angled planar surface facing said expansion chamber in the shape of the truncated planar surface of a hollow, annular, truncated cylinder, said truncated planar surface forming an angle relative to the bottom of said hollow, annular, truncated cylinder of from about 30° to about 45° and said truncated planar surface lying at right angles to the longitudinal vertical plane of the cylindrical passageway, and wherein said housing has a plurality of pressure port passageways connecting the interior of said housing to the outside of said housing.

4,811,649

HYDRAULIC CONTROL APPARATUS

Martin Heusser, Munich, Fed. Rep. of Germany, assignor to Heilmeier & Weinlein, Fabrik fur Oelhydraulik GmbH & Co. KG, Fed. Rep. of Germany

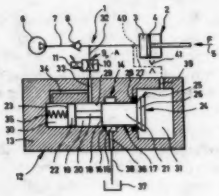
Filed Feb. 16, 1988, Ser. No. 156,366

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1987, 3705170

Int. Cl.[4] F15B *13/02*

U.S. Cl. 91—47 **12 Claims**

1. A hydraulic control apparatus (1, 1', 1''), particularly lift control apparatus for at least one single-acting hydraulic motor (2, 2') adapted to lift a load (5), to carry the load under stationary conditions, and to be operable in opposite directions under said load, comprising a two-way flow regulator disposed in a return passage (32) leading to a reservoir (37), said flow regulator comprising a metering restriction (9) and a pressure equalizer (12) including a variable restriction (14) controlled by a control piston (17) mounted in a housing bore (29) for displacement between a release position and a hold position, the ends (23, 24) of said piston being disposed in two control chambers (31, 30) of which the control chamber (30) containing the piston end (23) to be acted on in the direction towards the release position of said control piston is supplied with the pressure prevailing downstream of said metering restriction (9), while the control chamber (31) containing the piston end to be acted on in the direction towards the hold position of said control piston is supplied with the pressure prevailing upstream of said metering restriction (9), characterized in that the



piston end (24) of said control piston (17) adapted to be acted on by said pressure prevailing upstream of said metering restriction (9) is provided with a closure element (25), that said closure element (25) has a valve seat (27) associated therewith in said control chamber (31), that said closure element (25) sealingly cooperates with said valve seat (27) in the manner of a poppet valve in the hold position of said control piston (17), and that said return passage (32) is provided with a shut-off member (A, A') adapted to be actuated to a load pressure holding shut-off position.

4,811,650

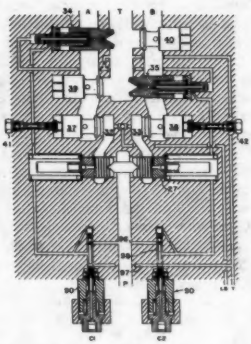
POWER TRANSMISSION

Kurt R. Lonnemo, Bloomfield Hills, Mich., assignor to Vickers, Incorporated, Troy, Mich.

Filed Aug. 28, 1987, Ser. No. 90,660

Int. Cl.[4] F15B *11/08*

U.S. Cl. 91—461 **32 Claims**



1. A hydraulic control system comprising

a hydraulic actuator having opposed openings adapted to alternately function as inlets and outlets for moving the element of the actuator in opposite directions,

a pump for supplying fluid to said actuator,

a directional valve to which the fluid from the pump is supplied,

said valve being pilot pressure controlled,

a pair of lines extending from said directional valve to said respective openings of said actuator,

a pair of pressure reducing valves,

a pilot controller for alternately supplying fluid at said first pilot pressure to said reducing valves for controlling the direction of movement of the directional valve,

each said reducing valve being connected to a source and operable by said first pilot pressure to apply a second pilot pressure to control movement of the directional valve,

a pair of lines extending from the pressure valves to said directional valve for applying said second pilot pressure from said pressure reducing valve to said directional valve for controlling the direction and movement of said directional valve,

said pressure reducing valve including adjustable spring means for adjusting the second pilot pressure for tolerances in the pilot controller as well as in the directional valve to adjust the threshold and minimize the lead band,

said pressure reducing valve including a first body section,

a second body section threaded on said first body section,

an inlet member having an opening therethrough communicating with the passageway in the first body section to one end of the spool,

said spring means being interposed between said one end of the spool and said inlet member such that rotation of the second body section relative to the first body section adjusts the spring force on the end of the spool.

4,811,651

SPRING BRAKE CYLINDER

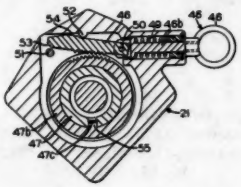
Yasuhisa Hata, Akashi, and Osamu Akamatsu, Kobe, both of Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Mar. 27, 1987, Ser. No. 32,146

Claims priority, application Japan, Mar. 28, 1986, 61-71600

Int. Cl.[4] F01B *9/00*

U.S. Cl. 92—29 **7 Claims**



1. A spring brake cylinder assembly, said assembly comprising:

(a) a body portion having a pair of axially opposed end walls;

(b) a piston positioned for reciprocal axial movement within said body portion, said piston having a face portion adjacent a first end wall of said body portion and a stem portion extending in an axial direction from an inner surface of said face portion of said piston;

(c) a piston guide means formed integrally with a second end wall of said body portion and engageable with said stem portion of said piston for guiding said piston in an axial direction during reciprocal axial movement of said piston;

(d) a brake spring caged between said inner surface of said face portion of said piston and said second end wall of said body portion to supply a predetermined braking force to said assembly;

(e) a pushrod engageable at one end thereof with said stem portion of said piston and extending coaxially out of said second end wall of said body portion;

(f) a clutch means positioned for engagement with each of said stem portion of said piston and said pushrod and said piston guide means for making a connection and disconnection of said pushrod with said piston thereby controlling their relative displacement in an axial direction;

(g) a clutch control means engageable with said clutch means and said piston guide means for controlling said clutch means between an engaged and disengaged state, said clutch control means including an elongated hollow portion surrounding said pushrod and extending out of said second end of said body portion; and

(h) a clutch operation means positioned adjacent said second end of said body portion and engageable with said clutch control means for manually releasing said assembly from a brake application.

4,811,652

PRESSURE DEVICE

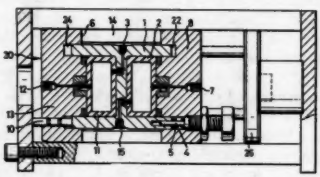
John W. Ells, Bexleyheath, England, assignor to The British Petroleum Company p.l.c., London, England

Filed Nov. 8, 1982, Ser. No. 439,934

Claims priority, application United Kingdom, Nov. 13, 1981, 8134217

Int. Cl.[4] F01B *19/00*

U.S. Cl. 92—92 **8 Claims**



1. A constant differential overpressure device for applying pressure from a first hydraulic fluid to a second hydraulic fluid comprising:

(a) a housing in which is located a double hollow piston having one side for receiving a first chamber adapted to receive a first hydraulic fluid and another side for receiving a second chamber adapted to receive a second hydraulic fluid,

(b) an opening in the housing for the entry of the first hydraulic fluid to said first chamber on one side of the piston,

(c) a second opening in the housing for the entry of the second hydraulic fluid to said second chamber on the other side of the piston whereby the pressure

of the first hydraulic fluid is exerted on the second hydraulic fluid, and

(d) additional means of exerting pressure on the piston so that the pressure exerted on the second hydraulic fluid is greater than that of the first hydraulic fluid.

4,811,653

VACUUM BOOSTER ENCLOSURE

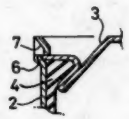
Michio Kobayashi, and Kazunori Senoh, both of Higashi-matsuyama-shi, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1981, Ser. No. 315,807

Claims priority, application Japan, Nov. 12, 1980, 55-159143

Int. Cl.[4] F16J *3/02;* **B60T** *13/56;* **F01B** *19/00*

U.S. Cl. 92—98 D **4 Claims**



1. A booster enclosure comprising

a first, generally cylindrical shell which is open at one end and closed at the other end thereof, said first shell having a plurality of circumferentially spaced apart, radially inwardly extending claws formed on the rim of said first shell defining said open end thereof;

a second shell having a peripheral edge being of a size adapted for insertion into and close fitting contact within said open end of said first shell, said second shell having a plurality of circumferentially spaced-apart grooves formed in said peripheral edge, said grooves being alignable with said claws such that said second shell can be inserted into said first shell by aligning said grooves therewith causing said claws to pass through said grooves as said second shell is inserted into said first shell so that the mutually adjacent ends are overlapped;

resilient means positioned between said overlapped end portions, said resilient means being adapted to exert force on said end portions in both radial and axial directions; and

interlocking means comprising mating small projection means formed on at least one of the inner periphery of said first shell at said open end thereof and said peripheral edge, and small groove means formed on the other of said inner periphery and said peripheral edge of said second shell;

whereby when said second shell has been inserted into said first shell, said first and second shells can then be rotated relative to one another such that said claws are no longer in alignment with said grooves and thus extend over said peripheral edge of said second shell, said small projection means being of a small size sufficient to allow said rotation of said first and second shells past said small projection means, said rotation ceasing when said small projection means interlocks with said small groove means, such that said first and second shells are locked together by said interlocking means acting in cooperation with said claws and said resilient means.

4,811,654

INTERNAL COMBUSTION ENGINE PISTON WITH LATERALLY OFFSET CRUDGEON-PIN BORE IN PISTON HEAD AND BODY PORTIONS

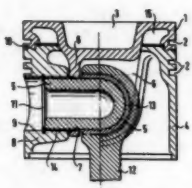
Fritz Rösch, Schwabach, Fed. Rep. of Germany, assignor to Alcan Aluminiumwerk Nürnberg GmbH, Nuremberg, Fed. Rep. of Germany

Filed Nov. 7, 1986, Ser. No. 928,413

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1985, 3540085

Int. Cl.[4] F02F *3/00, 3/16*; F16J *1/16*

U.S. Cl. 92—216 **12 Claims**



12. Piston for combustion engines comprising an upper part forming the piston crown and a lower part forming the piston body, the upper part and lower part abutting each other via annular contact surfaces in the axial direction of the piston and being coupled together by a gudgeon pin or a gudgeon pin bushing, wherein the contact surfaces are mutually prestressed in the direction of the piston axis in that the gudgeon pin bore in the one piston is arranged in the unstressed condition to be offset, relative to the gudgeon pin bore in the other piston part, towards the piston head along the piston axis.

4,811,655

MOTOR VEHICLE GEARBOX WITH ONE-WAY CLUTCH IN A SELECTED GEAR

Grzegorz Janiszewski, Angered, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Filed Mar. 9, 1987, Ser. No. 22,526

Claims priority, application Sweden, Mar. 17, 1986, 8601248

The portion of the term of this patent subsequent to Jan. 24, 2006, has been disclaimed.

Int. Cl.[4] F16H *3/10*

U.S. Cl. 74—331 **4 Claims**

1. In a motor vehicle gearbox, comprising a housing with at least one input shaft and at least one intermediate shaft having gears engaging gears on the input shaft, at least one gear in each pair of interengaging gears being releasable from its shaft, an over-running clutch connected between only the releasable gear for the lowest forward gear speed and the housing, said over-running clutch blocking the releasable gear for the lowest forward gear speed against rotation in a direction opposite the rotational direction for driving forward, said releasable gear for the lowest forward gear speed having a speed of rotation lower than that of said input shaft; the improvement in which said over-running clutch still permits a limited rotation of said gear in said opposite direction.

4,811,656

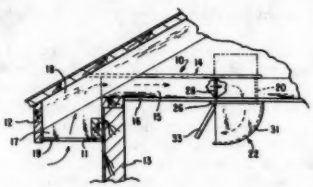
LIVESTOCK BUILDING VENTILATOR

Allan W. Meendering, 811 3rd St., Hull, Iowa 51239

Filed Mar. 21, 1988, Ser. No. 170,780

Int. Cl.[4] F24F *7/00*

U.S. Cl. 98—37 **4 Claims**

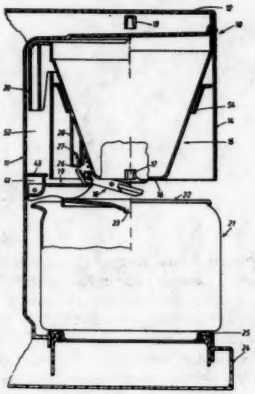


1. A system for providing fresh air to confined livestock comprising a building having a ceiling above a livestock confinement area, said building having an exterior formed to provide an opening to allow ingress of outside air into said building at a location above said ceiling, at least one deflector means installed on said ceiling in communication with said opening whereby said air will pass through said deflector means, said deflector means including air directing means, said air directing means being in close proximity to a wall of said building, and including an extension adapted to direct the air in a substantially horizontal direction to impinge on said wall to create turbulence.

4,811,657
ELECTRICALLY OPERATED COFFEE MAKING MACHINE

Edgar Rixen, Solingen, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG, Solingen, Fed. Rep. of Germany

Filed Feb. 17, 1988, Ser. No. 157,475
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1987, 8702616
Int. Cl.[4] H47J *31/00*
U.S. Cl. 99—295 12 Claims



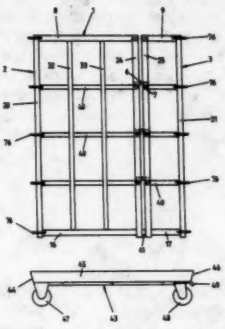
1. A coffee making machine comprising a housing; a filter holder; means for coupling said filter holder to said housing so that the filter holder is movable relative to the housing between operative and inoperative positions; and a filter provided in said filter holder and having a handle extending from said holder, said housing having a recess which receives at least a portion of said handle in the operative position of said filter holder so that said portion of said handle is concealed in said housing.

4,811,658
APPARATUS AND SYSTEM FOR DRAINING WHEY FROM CHEESE CURD FOR MANUFACTURING CHEESE

Wiebrand-Anno Brandsema, Valthermond, and Boeli Kuipers, Ter Apel, both of Netherlands, assignors to Arend B.V., Heembadweg, Netherlands

Filed May 19, 1987, Ser. No. 51,525
Int. Cl.[4] A01J *25/00, 25/12;* A23C *19/00*
U.S. Cl. 99—455 6 Claims

1. Apparatus for manufacturing cheese, having a mold comprising separate flat, perforated wall plates, a perforated bottom plate and a perforated follower plate, all of said plates being of a plastic material, an inflatable cushion of substantially the same area as said perforated follower plate, said cushion being mounted to exert a downward force to said follower plate, and a separate frame located on the outside of said wall plates adjacent to at least the upper and lower edges of said wall plates, said frame being arranged to engage said wall

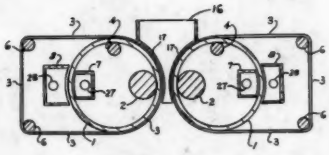


plates and to keep them relatively stationary with respect to each other.

4,811,659
ROLLER PRESS FOR LIQUID/SOLID SEPARATION

Roger A. Powell, 740 Jefferson St., Red Hill, Pa. 18076

Filed Jan. 25, 1988, Ser. No. 148,289
Int. Cl.[4] B30B *9/06*
U.S. Cl. 100—118 15 Claims



1. A roller press for separating a portion of the liquid component from a mixture of liquid and solids, comprising:

a. a first porous roller, having a cylindrical inner surface and a cylindrical outer surface,

b. a second porous roller, having a cylindrical inner surface and a cylindrical outer surface, said second porous roller having its axis parallel to the axis of said first porous roller and having said outer cylindrical surface spaced apart from said outer cylindrical surface of said first porous roller, thereby creating a nip,

c. a first inner roller, having a diameter small than than the diameter of said inner cylindrical surface of said first porous roller, and being in linear contact with said inner cylindrical surface in proximity to said nip,

d. a second inner roller, having a diameter smaller than the diameter of said inner cylindrical surface of said second porous roller, and being in linear contact with said inner cylindrical surface in proximity to said nip,

e. means for supporting the ends of said first inner roller and said second inner roller, wherein said rollers can rotate about their respective axes,

f. means for rotating said first inner roller and said second inner roller in counter-rotating directions, thereby causing said first porous roller and said second porous roller to rotate in the same direction as said first inner roller and said second inner roller respectively,

g. means for supplying said mixture into said nip in substantially the same direction as the motion of said outer cylindrical surfaces of said first porous roller and said second porous roller at said nip, thereby subjecting said mixture to a compressing action at said nip, thereby causing said

liquid to be forced into said first porous roller and said second porous roller,

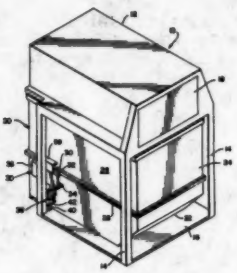
h. means for removing said liquid from said first porous roller and said second porous roller at locations displaced from said nip, said means comprising a compressed air stream directed at said inner cylindrical surface of said first porous roller and a compressed air stream directed at said inner cylindrical surface of said second porous roller, thereby locally pressurizing said inner cylindrical surfaces and forcing said liquid out of corresponding outer cylindrical surfaces.

4,811,660

MECHANICAL LOCK-IN DEVICE FOR A FRONT LOADER COMPACTION ASSEMBLY

James K. Robbins, Fayette, Ala., assignor to Marathon Corporation, Birmingham, Ala.

Filed Jan. 5, 1988, Ser. No. 140,785
Int. Cl.[4] B30B *15/06*
U.S. Cl. 100—229 A **11 Claims**



1. In a trash compactor assembly including a stationary compacting head and support, and a movable container subjacent the compacting head for receiving compacted trash, the container side having horizontally extending pockets for receiving lifting forks carried by a truck to effect removal of the container to dump the contents thereof into the truck, a lock-in device for normally retaining said container in fixed relation to the stationary compacting head, said device comprising

(a) a first member fixedly connected to a portion of the compacting head and support;

(b) a second member movably supported by said container and engaged with said first member to prevent movement of the container relative to the compacting head while in use;

(c) a portion of said second member being in engagement with a side pocket of the container, and

(d) a third member engaged with said second member and lying within the side pocket of said container in the path of the truck fork when it is inserted into the pocket;

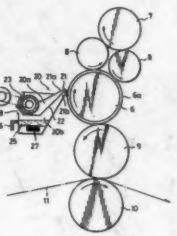
(e) said third member being moved by the fork as it passes through the side pocket, thereby effecting a corresponding movement of said second member, in a direction to remove it from engagement with said first member, to permit removal of the container from its position subjacent the stationary head for dumping, said second and third members returning to their initial position upon removal of the fork from the side pocket, thereby effecting locking engagement of said second member with said first member when the container is replaced in position subjacent the stationary head.

4,811,661

DAMPENING METHOD AND APPARATUS USING AN AIR NOZZLE AND MIST GENERATOR

Kazuo Maruta, 346-8, Oaza Takuma, Takuma-cho, Mitoyo-gun, Kagawa, Japan

Filed Dec. 18, 1987, Ser. No. 134,789
Claims priority, application Japan, Dec. 20, 1986, 61-302840
Int. Cl.[4] B41F *7/30*; B41L *25/6*
U.S. Cl. 101—147 **5 Claims**



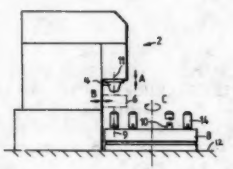
1. A unit to be assembled with an offset press for dampening a plate carried by a rotating plate cylinder, comprising a nozzle with a discharging mouth in a slit form and directed substantially at a tangent to an outer surface of the plate and extending in an axial direction of the plate cylinder, the discharging mouth being disposed in the vicinity of the surface of the plate, the interior of the nozzle being divided into upper and lower chambers from the innermost area thereof to the discharging mouth by a partition extending in the direction of an air stream over the whole length of the nozzle, thereby partitioning said discharging mouth into first and second jets which are respectively in communication with said upper and lower chambers; means disposed within the upper chamber for generating an air stream through the first jet; and means disposed within the lower chamber for generating a mist for flow through said second jet said second jet being arranged in front of said first jet relative to the direction of rotation of said plate.

4,811,662

METHOD FOR TINTING CONTACT LENSES

Saul C. Sterman, Jerusalem, Israel, assignor to Med Optics Corp., Panama, Panama

Filed Sep. 11, 1987, Ser. No. 95,206
Claims priority, application Israel, Sep. 16, 1986, 80039
Int. Cl.[4] B41F *17/00*
U.S. Cl. 101—170 **4 Claims**



1. A method for tinting contact lenses, comprising the steps of:

providing contact lenses;

providing at least one transfer-pad printer, including a suitable ink of the desired tint;

providing at least one printing block carrying an iris pattern;

presoaking said contact lenses in a soaking liquid;

placing said presoaked lenses onto lens mounts;

letting said presoaked lenses dry for a predetermined time while placed on said mounts, whereby said lenses are shrunk onto said mounts;

aligning a lens thus mounted with the pad of said transfer-pad printer;

inking said printing block;

causing said pad to pick up said iris pattern from said inked block, and

causing said pad to make contact with said mounted lens, thereby transferring said iris pattern as picked up from said block to said mounted contact lens.

4,811,663

DRIVING SYSTEM FOR SHEET-FED ROTARY PRINTING MACHINE

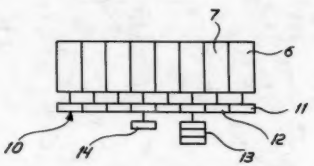
Victor Hefftler, Coswig; Hans Johne, Radebeul; Horst Schulz, Dresden; Arndt Jentzsch, Coswig, and Helmut Schöne, Radebeul, all of German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Dec. 29, 1986, Ser. No. 947,025

Claims priority, application German Democratic Rep., Dec. 27, 1985, 285548

Int. Cl.[4] B41F *13/00, 7/00*

U.S. Cl. 101—183 **4 Claims**



1. A sheet-fed rotary printing machine including a feeder for sheets to be printed, a series of at least four printing units wherein the first printing unit cooperates with said feeder and the last printing unit cooperates with a discharger for printed sheets, a gear train for interconnecting impression cylinders and transfer cylinders of respective printing units, and a driving system provided with a plurality of driving members for supplying a total driving power to said gear train, comprising a first driving member designed for transmitting to gears assigned to the cylinders of an intermediate printing unit immediately following said first printing unit a part of driving power which is a triple of respective power parts transmitted by the remaining driving member or members to gears assigned to cylinders of the subsequent printing units; and the total number of the driving members corresponding to the number of printing units in said series less two.

4,811,664

FUSE FOR SUB-MUNITION WARHEAD

Amir Levy, Ono; Ilan Glickman, Holon; Haim Berezniak, Rishon-Le-Zion, and Avraham Rosenberg, Holon, all of Israel, assignors to The State of Israel, Ministry of Defence, Israel Military Industries, Israel

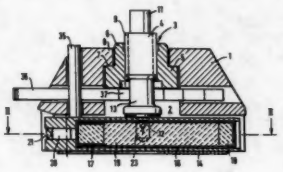
Filed Mar. 28, 1988, Ser. No. 173,993

Claims priority, application Israel, Mar. 31, 1987, 82066

Int. Cl.[4] F42C *15/04*

U.S. Cl. 102—226 **6 Claims**

1. A slider type fuse for a cargo warhead grenade comprising a housing adapted for mounting on said grenade and accommodating a striker pin assembly having a collar and a shaft screwingly mounted therein, which shaft has an inner end portion fitted with a striker pin and an outer tail portion adapted to carry drag producing means and is capable of being unscrewed and thereby to move within said collar in axial direction from a forward, locking to a retracted, armed position, the housing further accommodating a slider holding detonator means adapted for impact ignition by said striker pin, which slider is moveable radially from a retracted position in which said detonator means are out of alignment with said striker pin to a forward position in which said detonator means are in alignment with said striker pin, said slider being locked in the retracted position by said striker pin and being unlocked when said striker pin is retracted, the improvement by which said slider is moveable from the retracted to the forward, armed position by centrifugal forces resulting from the spin of the cargo warhead grenade; and further characterised by de-



layed action ignition means accommodated within said slider and comprising an igniter charge, a booster charge removed therefrom and located in close proximity to said detonator means and a delay charge located between the two, and swingable striker means associated with said igniter charge swingably mounted on the slider near an end thereof which projects out of said housing when the slider is in the forward, armed position, which swingable striker means are blocked in the retracted position and are unlocked in the forward, armed position of the slider and are capable of swinging by the action of centrifugal forces resulting from the spin of the cargo warhead grenade thereby to strike said igniter charge.

4,811,665

MAGNETIC SENSOR ARRANGEMENT

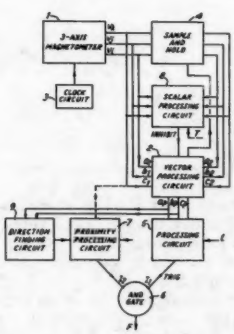
Richard C. D. Clutterbuck, Cobham, England, assignor to Thorn Emi Electronics Limited, Hayes, England

Filed Mar. 18, 1987, Ser. No. 35,041

Claims priority, application United Kingdom, Mar. 19, 1986, 8606794

Int. Cl.[4] F42C *13/08*

U.S. Cl. 102—427 **9 Claims**

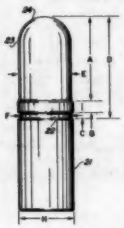


1. A magnetic sensor arrangement for monitoring movement of a vehicle on a path, the arrangement comprising means sensitive to magnetic field strength in three mutually orthogonal directions to generate respective electrical signals representing a magnetic field vector related to the current position of the vehicle,

and means to combine respective said electrical signals corresponding to two successive positions of the vehicle to

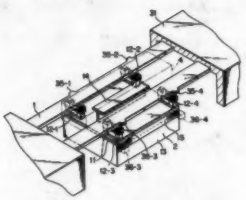
evaluate a parameter related to the trajectory of the vehicle.

4,811,666
SOLID PROJECTILES
Eric A. Lutfy, 125 E. Missouri Ave., Phoenix, Ariz. 85012
Filed Jan. 4, 1988, Ser. No. 140,385
Int. Cl.[4] F42B *11/00*
U.S. Cl. 102—501 **8 Claims**



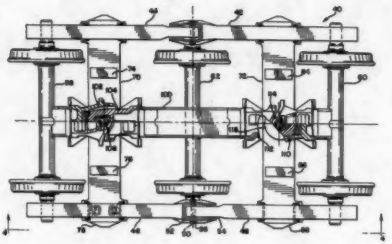
1. A projectile for small arms ammunition comprising:
a projectile body made of a homogeneous solid material,
said material comprising a copper alloy consisting of approximately 61.5% of copper, approximately 35% of zinc, approximately 3% of lead and approximately 0.5% of tin.

4,811,667
TRANSPORTATION SYSTEM OF A FLOATED-CARRIER TYPE
Mimpei Morishita, and Teruo Azukizawa, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed May 6, 1987, Ser. No. 46,318
Claims priority, application Japan, May 14, 1986, 61-109913
Int. Cl.[4] B60L *13/06, 13/10*
U.S. Cl. 104—284 **10 Claims**



1. A transportation system of a floated-carrier type comprising:
a guide rail made of ferromagnetic material and extending in a longitudinal direction, said guide rail having a side surface and a lower surface;
a carrier with a cargo carried thereon capable of running along the guide rail;
a magnetic unit mounted on the carrier and having an electromagnet confronting the lower surfaces of the guide rail with an air gap defined therebetween, the electromagnet generating main flux and leakage flux, the electromagnet and guide rail creating a magnetic circuit along which the main flux passes, thereby producing a first magnetic attraction between the electromagnet and guide rail, whereby said carrier is floated relative to the guide rails in a non-contact manner;
means for running said carrier along the guide rail and for slowing down said carrier when said carrier is just about to enter into a stop position, said means for running including carrier-stopping means for substantially stopping said carrier at the stop position; and
a ferromagnetic member provided on the side surface of a predetermined portion of said guide rail, the predetermined portion being located such that the electromagnetic of said magnetic unit confronts the predetermined portion when the carrier has stopped at the stop position,
whereby, when said carrier is substantially stopped at the stop position, the leakage flux generated by the electromagnet flows through the ferromagnetic member, thereby producing a second magnetic attraction weaker than the first magnetic attraction between the electromagnet and said ferromagnetic member, so that the electromagnet is attracted toward the predetermined portion, allowing said carrier to be position at the stop position.

4,811,668
THREE AXLE RAILWAY TRUCK
Charles Moehling, Arlington Heights, Ill., assignor to Amsted Industries Incorporated, Chicago, Ill.
Filed Jan. 19, 1988, Ser. No. 145,260
Int. Cl.[4] B61F *5/00*; B61D *17/00*
U.S. Cl. 105—4.1 **11 Claims**

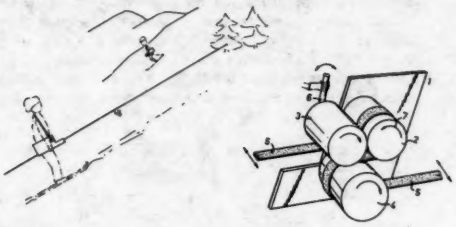


9. A railway truck comprising
two parallel sideframes,
two end axles extending between said side frames near the ends thereof and a center axle extending between said sideframes at about the longitudinal midpoint thereof,
two bolsters extending between said side frames each bolster located longitudinally between one of said end axles and said center axle,
each sideframe having bolster openings receiving an end of one of said bolsters,
a connecting means between said bolsters,
wherein said connecting means comprising a center pocket in each bolster and a shank having two ends, each end forming part of an articulated connector and being received in the center pocket in a respective one of said bolsters.

4,811,669
PORTABLE DRIVE MEANS SUPPORTED ON A SKIER
Sten Dahlman, Stockholm, Sweden, assignor to Industrimekanik I Stockholm AB, Stockholm, Sweden
Filed Mar. 31, 1986, Ser. No. 846,343
Claims priority, application Sweden, Apr. 11, 1985, 8501783
Int. Cl.[4] B61B *7/06*
U.S. Cl. 105—30 **5 Claims**

1. A personal ski lift comprising a frame, means to support the frame on the body of a skier, a motor-driven drive roller carried by the frame and contacting a stationary flexible elongated member disposed along the desired path of travel of the skier along a slope to be ascended, a tension roller contacting said flexible member adjacent said drive roller, said flexible member removably engaging each of said drive and tension rollers to permit removal of said ski lift from contact with said

flexible member, means mounted on the frame and operable by said skier for selectively establishing and releasing driving connection between said flexible member and the drive roller



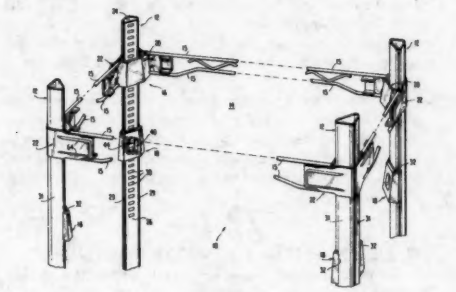
by movement of one of said drive and tension rollers toward or away from each other, whereby when said driving connection is established between said flexible member and said drive roller, said skier is towed along said flexible member.

4,811,670

SHELF SUPPORT SYSTEM HAVING A TRIANGULAR SUPPORT POST

Albert Kolvites, Mountaintop, and Rodney E. Brancher, Wyoming, both of Pa., assignors to Intermetro Industries Corporation, Wilkes-Barre, Pa.

Filed Jul. 24, 1987, Ser. No. 77,645
Int. Cl.[4] A47B *9/08*
U.S. Cl. 108—107 **37 Claims**



1. A system for supporting a shelf having a periphery that defines at least one corner and an interior and an exterior of the shelf, said system comprising:

a corner bracket mounted with each said corner of said shelf and having a face portion having at least one surface inclined downwardly and inwardly with respect to said shelf interior;

at least one collar having two sides that define a generally right angular apex;

means for mounting each said collar with one said corner bracket thereby to for an open sleeve having a generally right triangular cross-section, at least a major part of said face portion defining the hypotenuse and said sides of said collar defining the adjacent sides of said generally right triangular cross-section;

a support post having two side surfaces, forming a generally right angular apex, and a hypotenuse surface that together define a generally right triangular cross-section congruent to the cross-section of said sleeve, said post thereby being formed to be received in said sleeve;

a wedge member having at least one inclined face complementary to said inclined surface of said face portion; and

means for mounting said wedge member at a fixed location on said hypotenuse surface of said support post and adjacent said face portion of said corner bracket, with said inclined wedge portion of said wedge member inclined downwardly and inwardly with respect to said shelf interior;

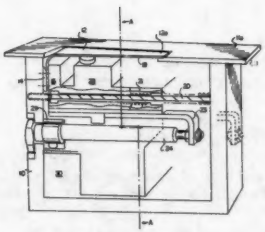
whereby downward movement of said shelf with said support post and said wedge member mounted thereon received in said sleeve causes said wedge portion of said wedge member and said inclined surface of said face portion tightly to engage thereby to urge said generally right angular apex of said support post into tight engagement with said generally right angular apex of said collar and said side surfaces of said support post into tight engagement with said sides of said collar.

4,811,671

HANDLING LIMP FABRIC

Warren J. Hancock, Victoria, Australia, assignor to Pacific Dunlop Limited, Victoria, Australia

PCT No. PCT/AU86/00074, § 371 Date Nov. 14, 1986, § 102(e) Date Nov. 14, 1986, PCT Pub. No. WO86/05467, PCT Pub. Date Sep. 25, 1986
PCT Filed Mar. 21, 1986, Ser. No. 939,777
Claims priority, application Australia, Mar. 22, 1985, PG9868
Int. Cl.[4] D05B *21/00*
U.S. Cl. 112—121.26 **4 Claims**



1. A device for gripping and pulling a marginal portion of a fabric piece comprising:

(a) a base adated for attachment to a support upon which a fabric piece may be supported,

(b) a finger support mounted on said base,

(c) a finger mounted on said finger support to occupy a retracted position substantially at or below the surface of said support,

(d) first means operable to effect reciprocal movement of the finger support relative to said base generally in the direction of the length of the finger when said finger is in an extended position in which a free end portion of the finger is above the level of said surface to locate said free end portion in gripping engagement with said marginal portion of said fabric piece, and when so located urge the withdrawal of said finger to thereby pull the fabric in the direction of withdrawal, and

(e) second means mounted on said first means for selectively moving said finger to said extended position.

4,811,672

EDGE TRIMMER GUIDE FOR SEWING MACHINE

Naoichi Nishi, Sanjo, Japan, assignor to Nishi Seisakusho Co., Ltd., Niigata, Japan

Filed Nov. 25, 1986, Ser. No. 934,745
Int. Cl.[4] D05B *35/10, 37/06*
U.S. Cl. 112—128 **2 Claims**

1. An edge trimmer guide removably attached to an edge trimmer for a sewing machine having a needle fastened to a needle bar by a clamping screw,

said edge trimmer having a stand with a base,

a lower lever being pivotably supported about a mid-portion thereof by the stand and having two ends,

a link being connected at one end to one of the two ends of the lower lever,

an upper lever pivotably supported about a point between two ends thereof by the stand, said upper lever being connected at one end to an opposing end of the link and being connected at an opposite end to the clamping screw of the needle bar,

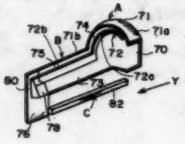
a cylindrical arm projecting from the other end of the two ends of the lower lever,

a cutter depending at one end from one end of the cylindrical arm and having a shearing edge at an opposite end for cutting cloth,

means secured to the base for guiding cloth into contact with the cutter,

a presser foot secured to the base,

a shearing plate being secured to the base and having a shearing edge, and



cover plate means, secured to the stand, for protectively extending around the cylindrical arm by leaving a clearance therebetween, said cover plate means having a back cover, a side cover with a front edge, a horizontal edge and a vertical edge,

said said trimmer guide comprising:

a head having an outer cylindrical wall and an inner cylindrical wall both of which are integral with a vertical wall of the head and leave a clearance therebetween to form a first slit;

a body having two horizontal walls extended from the outer cylindrical wall and the inner cylindrical wall respectively both of which leave a clearance therebetween to form a second slit;

a depending wall and a slanted wall both of which are arranged to form a third slit therebetween; and

a guide foot having a projected foot integral with the depending wall of the body, the guide foot being arranged in front of the means secured to the base for guiding cloth into contact with the cutter and underneath the cylindrical arm in parallel therewith.

4,811,673

INFORMATION DISPLAY FOR A ZIGZAG SEWING MACHINE

Noriyuki Yoshida, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 7, 1987, Ser. No. 82,597

Claims priority, application Japan, Aug. 9, 1986, 61-187544

Int. Cl.[4] D05B *3/02*

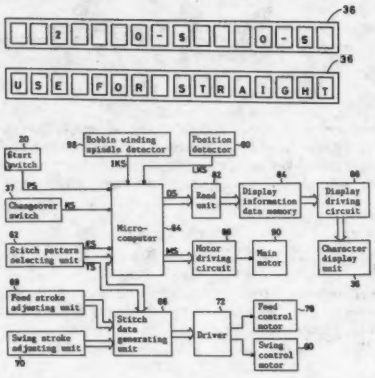
U.S. Cl. 112—445 **6 Claims**

1. An information display for a zigzag sewing machine having a frame, a feed mechanism supported in said frame for selectively feeding a workpiece, a needle bar with a needle supported in said frame so as to be capable of endwise reciprocating and selectively lateral jogging, selecting means including selecting members to be operated for selecting a desired stitch pattern among a plurality of predetermined stitch patterns and adjusting means for setting at least either the amplitude of said needle for forming said selected stitch pattern or the feed of said feed mechanism for forming said selected stitch pattern, and being capable of forming a stitch pattern according to sewing conditions adjusted by said adjusting means, said information display comprising;

a display unit provided in a front side of said frame;

memory means for storing display information data comprising a first data for displaying optimum set values for each stitch pattern to be adjusted by said adjusting means and a second data for displaying messages relating to the selected stitch pattern explaining at least either sewing operation for forming said each stitch pattern or a method of forming said each stitch pattern;

a read means for reading said display information data for a selected stitch pattern from said memory means according



to a code signal corresponding to said stitch pattern selected by said selecting means, and for supplying said data read to said display unit;

a changeover member for changing an information displayed on said display unit, provided in said front side of said frame; and

sequence deciding means for deciding the sequence of supplying said first data and said second data, and for controlling said read means to read said first data in response to the operation of said selecting members, and to read said second data in response to the operation of said changeover member.

4,811,674

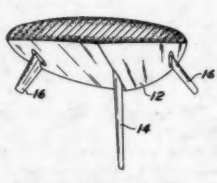
FOIL ARRANGEMENT FOR WATER-BORNE CRAFT

Leo J. Stewart, Hudson, Canada, assignor to Motion Design Creations Inc., Hudson, Canada

Filed Oct. 15, 1986, Ser. No. 919,220

Int. Cl.[4] B63B *1/28*

U.S. Cl. 114—39.2 **19 Claims**



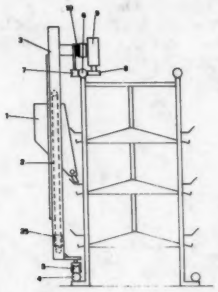
1. A water-borne craft including a hull, and a pair of wing-like foils positioned on the bottom of the hull toward the rear or stern portion of the craft in equally spaced relation on opposite sides of the fore and aft center line or symmetry axis of the hull so as to be substantially fully immersed in the water when in use, said foils being movable relative to said hull between (A) a first position such that, in use, said foils meet the relatively moving water and generate a lifting force which reacts with the hull so as to tend to lift the rear portion of the hull upwardly and (B) a second position wherein no lifting force is exerted by one or other of the foils, as for example, during turning motion of the hull.

4,811,675

APPARATUS FOR AUTOMATIC AND CONTINUOUS DISPENSING OF FOOD IN FEEDING TROUGHS FOR BATTERY-REARED POULTRY

Ruggero Segalla, Vicenza, Italy, assignor to Ska S.P.A., Vicenza, Italy

PCT No. PCT/IT86/00076, § 371 Date Jul. 14, 1987, § 102(e) Date Jul. 14, 1987, PCT Pub. No. WO87/02547, PCT Pub. Date May 7, 1987
PCT Filed Oct. 17, 1986, Ser. No. 71,271
Claims priority, application Italy, Oct. 23, 1985, 85606
Int. Cl.[4] A01K *39/012*
U.S. Cl. 119—52 B 4 Claims



1. Apparatus for the automatic and continuous dispensing of feed into the feeding troughs of batteries of cages for keeping poultry of the type which comprises a hopper (1), from which the feed is made to descent into the feeding troughs positioned opposite each cage, a frame bearing the cages, wherein said hopper (1) is movably mounted on a column (3), said column sliding horizontally by means of guide rollers (5, 7, 8) along a rail (4) at the bottom of said apparatus and an upper rail (6), said bottom and upper rails being prearranged on the sides of the cages to be supplied, a screw (17) at the bottom of said apparatus and partially immersed in said hopper, a motor (18) fitted with a reducer (19) for rotating said screw, a ball (20) moving on said screw, said ball stirring said feed, the quantity of feed being dispensed being determined by the rate of rotation of said screw, the upper and bottom rails presenting rectilinear portions, connected by curved portions which enable the apparatus to go from one side to the other of the cages and at the end of each passage of the hopper along all the cages of the same level, a motor (9) for driving one of said rollers (8), a control means compels the hopper to be displaced vertically to a different level for the purpose of beginning the supply to the cages of the new level along said battery of cages, thus permitting easy and automatic supply of feed at the different levels of the entire installation.

4,811,676

ASYMMETRIC MINIMUM RESISTANCE HULL

Peter Franke, 390 Jones Avenue, Toronto, Ontario, Canada M4J 3G3

Filed Nov. 27, 1987, Ser. No. 125,927
Claims priority, application Canada, Mar. 27, 1987, 533145
Int. Cl.[4] B63B *1/10*
U.S. Cl. 114—56 8 Claims

1. For use in a plural hull vessel, a hull configuration having a prow and a stern, comprising:

a forward cutting edge at the prow sloping downwardly, rearwardly and laterally from a top point,

a first side wall sloping downwardly and inwardly throughout its length, and terminating at said edge, and

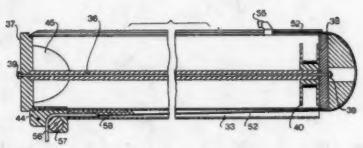
a second side wall terminating at said edge, said second side wall having a spiraling configuration in which it slopes downwardly and outwardly adjacent the prow and slopes downwardly and inwardly adjacent the stern, the second side wall undergoing a smooth transition between its two ends.

4,811,677

RIG FOR A SAIL CARRYING BOAT

Mogens Pedersen, Egå ; Günther Wiesel, Åbenrå , and Niels Brenholdt, Rohde, Denmark, assignors to MP-Sejl A/S, Egå , Denmark

Filed Jan. 20, 1987, Ser. No. 4,636
Claims priority, application Denmark, Jan. 17, 1986, 252/86
Int. Cl.[4] B63H *9/04*
U.S. Cl. 114—89 7 Claims



1. In a rig for a sail-carrying boat which includes a mast, a boom which is pivotally connected to the mast and a sail which has a luff, a leech and a bottom edge, the improvement wherein said boom comprises

a tubular body which extends from a first end near the mast to a second end remote from the mast and is defined by a top portion and a bottom portion, said tubular body including a longitudinal slot in its upper portion through which said sail can extend into a chamber formed therein,

a bracket pivotally connecting the first end of said tubular body to said mast,

a first end plate positioned over the first end of said tubular body, said first end plate including a hole therein,

a second end plate positioned over the second end of said tubular body, said second end plate including a hole therein,

a shaft which extends through the chamber in said tubular body and through said holes in said first and second end plates,

means for tensioning said shaft between said first and second end plates and for pressing said first and second end plates against said tubular body, and

a hollow rod rotatably positioned around said shaft, the bottom edge of said sail being attached to said hollow rod so that rotation of said hollow rod around said shaft during reefing will cause said sail to be wrapped therearound and become reefed.

4,811,678

SAILBOAT SAIL WITH A FULL-WIDTH, FULL-DEPTH, HORIZONTALLY OUTSTANDING SHIELD LOCATED AT AN INTERMEDIATE LEVEL

Hans Sogell, Yxvägen 19, S-181 47 Lidingö, Sweden

Filed Oct. 9, 1987, Ser. No. 106,364
Int. Cl.[4] B63H *9/06*
U.S. Cl. 114—103 4 Claims

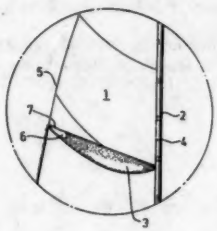
1. A sailboat sail, comprising:

a sheet of material of generally triangular outline having a generally horizontal lower edge and, extending upwards from said lower edge to an apex, a mast edge and a free edge, said material having two opposite surfaces and being

sufficiently flexible that, rigged and in use in a wind, the sheet is concave between said mast edge and said first edge on whichever said surface is upwind when a said surface is upwind and an opposite said surface is downwind, and convex between said mast edge and said free edge on whichever said surface is downwind when a said surface is downwind and an opposite said surface is upwind;

at least one horizontally elongated flexible, lamella-like shielding device having two opposite side edges and two opposite ends;

said shielding device being disposed on one said surface of said sail at a level intermediate said lower edge and said



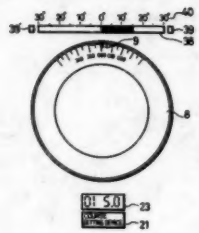
apex, with one said side edge thereof secured therealong to said sheet and the other said side edge thereof standing free of said sheet when said sheet is maximally billowed by the wind when said surface is disposed upwind, in a substantially straight line extending substantially from said mast edge of said sheet substantially to said free edge of said sheet, whereby a concavity defined by said one surface of said sheet is substantially fully divided depthwise thereof into an upper portion located above said shielding device and a lower portion located below said shielding device, wherein when said surface is not disposed upwind said shielding device remains collapsed against said surface.

4,811,679

MARINE AUTOMATIC STEERING APPARATUS

Isao Masuzawa; Toshio Miyayama, both of Kuroiso; Mitsuo Nakayama, Itami, and Koichi Nishimura, Yokohama, all of Japan, assignors to Kabushiki Kaisha Tokyo Keiki, Tokyo, Japan

Filed Aug. 27, 1986, Ser. No. 900,821
Claims priority, application Japan, Aug. 30, 1985, 60-191329
Int. Cl.[4] G05D *1/00*
U.S. Cl. 114—144 RE **11 Claims**



1. A marine automatic steering apparatus for setting a desired course in a digital fashion, comprising:

(a) course setting means for setting a desired course and for delivering a desired set course signal;

(b) steering repeater means having a repeater card and a lubber line for delivering a ship's heading signal; and

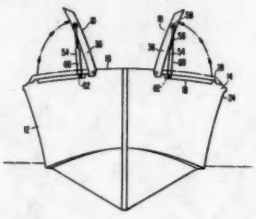
(c) a course deviation indicator located adjacent said repeater card and having a zero point at a position coincident with the lubber line of said steering repeater means for indicating, in analog fashion, a course deviation between said desired set course signal and said ship's heading signal, said course deviation being indicated on one or the other side of said zero point.

4,811,680

GULLWING-TYPE DECK HATCH ASSEMBLY

Richard E. Genth, Englewood, Fla., assignor to Donzi Marine Corporation, Tallevast, Fla.

Filed Feb. 9, 1987, Ser. No. 12,158
Int. Cl.[4] B63B *19/14*
U.S. Cl. 114—201 R **6 Claims**



1. A deck hatch assembly for marine craft having a hull, a bulkhead, a deck and an upper deck surface, said deck hatch assembly comprising a submerged surface integrally formed in said upper deck surface and merging therewith by means of a pair of upper deck surface side walls and an upper deck surface rear wall, said submerged surface extending at one side through said bulkhead, a hatch opening formed in said submerged surface communicating with an area below said deck, a raised peripheral ridge surrounding said hatch opening and being formed integral with said upper deck surface, said raised peripheral ridge being defined by a planar top surface and first and second generally vertical walls, a seal secured to said top surface of said ridge, a drainage channel defined between said ridge, said submerged surface and said upper deck surface side and rear walls, a hatch cover pivotably associate with said hatch opening, said hatch cover having a rear edge, a pair of pivot mechanisms securing said rear edge with respect to said hatch opening for pivotable movement of said hatch cover from a closed position wherein said hatch cover is supported by said top surface of said ridge so as to close off said hatch opening, to an open position wherein said hatch cover is raised upwardly from said bulkhead toward said marine craft whereby said hatch opening is uncovered and unobstructed, a pair of gas spring assemblies pivotably mounted between said hatch cover and proximate said ridge for retaining said hatch cover in said open position, said gas spring assemblies and said pivot mechanisms being located so as not to obstruct said hatch opening, said hatch cover being flush with said upper deck surface and said bulkhead in said closed position, said top surface of said ridge being adapted to uniformly support said hatch cover in said closed position, said submerged surface, said top surface of said ridge and said hatch cover all being parallel to each other, said ridge, said submerged surface, and said upper deck surface together being formed of an integral molding, said deck hatch assembly being adapted to include styling lines of said deck, said deck hatch assembly being provided in said upper deck surface on the port and starboard sides of said marine craft such that the hatch cover of each of said deck hatch assemblies assumes, in said open position, a gullwing-type configuration, whereby said area below said deck is ventilated and access through said hatch opening is provided.

4,811,681

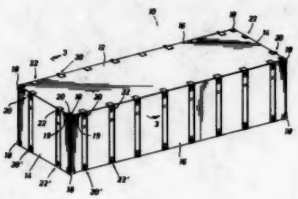
CONSTRUCTION TRANSPORTATION SYSTEM

Alces P. Robishaw, 9333 Memorial, #210, Houston, Tex. 77024, and Paul A. Robishaw, 10122 Meadow Lake La., Houston, Tex. 77042

Continuation of Ser. No. 757,631, Jul. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 642,181, Aug. 17, 1984, Pat. No. 4,610,215. This application Jul. 7, 1987, Ser. No. 70,348

Int. Cl.[4] B60P 7/13

U.S. Cl. 114—267 48 Claims



48. A construction transportation system comprising at least one transport assembly, said assembly comprising at least two spud well type construction components, each of said components being generally in the form of a rectangular parallelepiped and having:

a throughway extending vertically therethrough for receipt of an elongate spud member;

a width generally equal to c2/y, where c2 is the length of an ISO standard freight container, and y is an integer;

a length generally equal to the width of an ISo standard freight container;

releasable connection means on at least some of the lengthwise sides of said components;

the number y of such components being connected side-by-side by said connection means in said assembly; said assembly having gross dimensions generally corresponding to those of an ISO standard freight container.

4,811,682

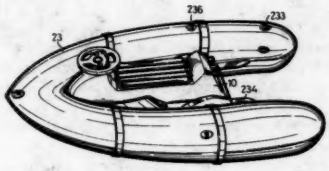
MINI INFLATABLE YACHT

Chi Y. Hwang, No. 21, Lane 20, Chung Cheng N. Rd., Sun Chong City, Taipei Shien, and Liu P. Chih, No. 29, Lane 426, Wor Long Street, Taipei City, both of Taiwan

Filed Feb. 26, 1988, Ser. No. 160,910

Int. Cl.[4] B63B 7/08

U.S. Cl. 114—345 3 Claims



1. A mini inflatable yacht comprising a mini yacht and an inflatable bladder, wherein:

said mini yacht comprises a boat body having an open top provided with an external propeller means for propelling the boat body through water;

said boat body containing an electric battery means for providing electrical power, a motor means, electrically connected to said battery means, for providing propulsive power, a transmitting assembly means for waterproofly drivingly connecting said motor means to said external propeller means, and fan means for blowing air through said boat body;

said boat body having an outer circumference and a plurality of downwardly extending pins mounted on said outer circumference;

said mini yacht further comprising a waterproof plate closing said open top of said boat body, said waterproof plate having an air inlet pipe and an air outlet pipe extending therethrough to allow circulation of air through said body body; a lid for covering said waterproof plate, said lid provided with at least one aperture therethrough; a removable seat detachably connected to said lid, said removable seat and said lid defining a storage compartment; manually actuable rudder means, mounted on said boat body, for steering said mini yacht; handle means, operatively connected to said rudder means, for manually actuating said rudder means;

said inflatable bladder being provided with an inner flange, said inner flange being provided with a plurality of holes therethrough corresponding to said plurality of downwardly extending pins mounted on said outer circumference of said boat body, each of said plurality of holes receivable of a corresponding one of said plurality of downwardly extending pegs;

said inflatable bladder, when deflated, being foldable and said folded bladder being receivable within said storage compartment.

4,811,683

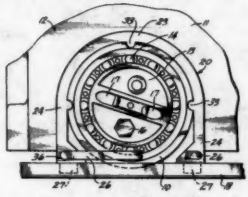
SLIDING DOOR WHEEL RETAINER

John D. Gephart, La Verne, and Torsti T. T. Jerila, West Covina, both of Calif., assignors to Acme General Corporation, San Dimas, Calif.

Filed Jan. 30, 1987, Ser. No. 8,822

Int. Cl.[4] E05D 13/02

U.S. Cl. 16—97 26 Claims



1. A wheel retainer for a sliding door having a door panel, a floor track and a wheel for rolling along the track and supporting the door panel, the retainer comprising:

a body;

means on the lower portion of the body for engaging a downwardly facing portion of the track for inhibiting upward movement of the retainer from the track; and

means on the upper portion of the body for engaging an upper portion of the perimeter of the wheel for inhibiting upward movement of the wheel.

4,811,684

PHOTO CVD APPARATUS, WITH DEPOSITION PREVENTION IN LIGHT SOURCE CHAMBER

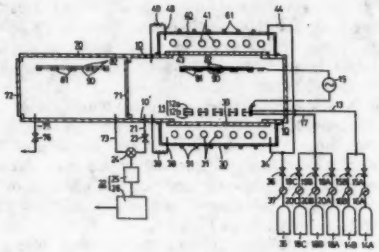
Mamoru Tashiro; Kazuo Urata, and Shunpei Yamazaki, all of Tokyo, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Tokyo, Japan

Division of Ser. No. 801,769, Nov. 26, 1985, abandoned. This application Sep. 3, 1987, Ser. No. 92,529

Claims priority, application Japan, Nov. 26, 1984, 59-250339; Nov. 26, 1984, 59-250341

Int. Cl.[4] C23C *14/00, 16/00*

U.S. Cl. 118—50.1 **5 Claims**



1. A photo CVD apparatus comprising: a reaction chamber;
a vacuum pump for evacuating said reaction chamber;
means for inputting a reactive gas into said reaction chamber;
a light source chamber provided on said reaction chamber and separated from the inside of said reaction chamber by a transparent window;
a light source disposed in said light source chamber to irradiate the inside of said reaction chamber with light through said window; and
a conduit connected with both said reaction chamber and said light source chamber for making communication therebetween wherein said conduit is provided with means for preventing said reactive gas from depositing as a solid product on the inside wall of said light source chamber.

4,811,685

CARRIAGE-TYPE CONVEYOR

Masasumi Murai, Saitama, Japan, assignor to Tsubakimoto Chain Co., Osaka, Japan

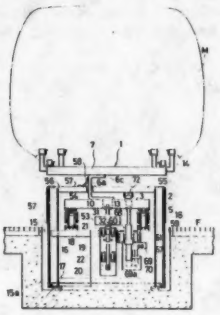
Filed Oct. 5, 1987, Ser. No. 105,310

Claims priority, application Japan, Oct. 7, 1986, 61-153141[U]; Nov. 18, 1986, 61-176048[U]; Dec. 17, 1986, 61-193051[U]; Jul. 28, 1987, 62-114539[U]

Int. Cl.[4] B05B *15/12*

U.S. Cl. 118—326 **14 Claims**

12. For a painting and drying line having a painting booth, a conveyor assembly comprising a conveyor unit for travel in a predetermined path including a zone within said painting booth in which the conveyor unit is stabilized against lateral sway, comprising:
a frame having swivelable wheels at four corners for supporting a load;
a carrier supporting said frame, and a carrier rail to define said predetermined path and operable to support and guide said carrier therealong;
drive means extending along said predetermined path conveying said carrier and said frame along said carrier rail;
drive coupling means on said carrier having an operative position connecting said carrier to said drive means to effect conveyance, and an inoperative position disconnecting said carrier and said drive means to inactivate said conveyance; and
wheel-guide rails underlying the swivelable wheels of said frame in said painting booth zone to stabilize the lower frame against lateral sway, said wheel-guide rails having entrance gates to orient the wheels in the rails, and entrance and exit ramps, respectively, to elevate said wheels



and said frame as the wheels enter the rails and to lower said wheels and said frame as the wheels exit the rails, whereby said wheel-guide rails support said unit in the painting zone.

4,811,686

DEVELOPING DEVICE OF AN ELECTROPHOTOGRAPHIC MACHINE

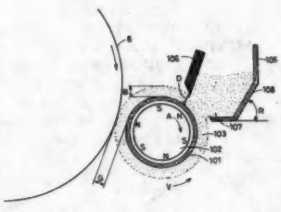
Hidenobu Yamane, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 822,936, Jan. 27, 1986, abandoned, which is a continuation of Ser. No. 532,962, Sep. 16, 1983, abandoned. This application Mar. 27, 1987, Ser. No. 31,187

Claims priority, application Japan, Sep. 17, 1982, 57-162768

Int. Cl.[4] G03G *15/09*

U.S. Cl. 118—657 **2 Claims**



1. A developing device for an electrophotographic copying apparatus of the type that utilizes toner particles for developing an image on a light-sensitive member, said apparatus comprising:
a rotatable light-sensitive member on which an electrostatic latent image can be formed;
means for charging said light-sensitive member with an electrostatic latent image having a charge of a pre-determined polarity;
means for providing toner particles and for charging said toner particles with a charge of the same polarity as that of an electrostatic latent image formed on the light-sensitive member;
a rotatable developing roller comprising a magnetic roller and a sleeve, said sleeve being rotated relative to said magnetic roller, whereby said toner particles are charged and fed by said developing roller due to frictional charging of the toner particles rubbing against themselves and

with said sleeve resulting from the relative rotational speed between said sleeve and said magnetic roller; and

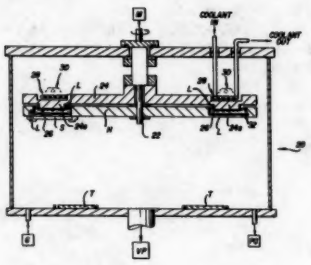
regulating means for regulating the thickness of said toner particles on said sleeve to be approximately equal to the distance between the light-sensitive member and the sleeve.

4,811,687

TEMPERATURE CONTROL APPARATUS FOR THIN FILM DEPOSITION SYSTEM

Eric T. Prince, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 14, 1987, Ser. No. 133,113
Int. Cl.[4] C23C *14/00*
U.S. Cl. 118—666 **10 Claims**



1. A thin-film deposition system for depositing thin films of a material on a substrate, said system comprising:

(a) a vacuum chamber;

(b) a substrate holder for supporting a substrate adapted to receive a thin film of material;

(c) means for advancing said substrate holder along a predetermined path within said vacuum chamber; and

(d) means for controlling the temperature of said substrate holder while said holder is advanced along said path, said temperature controlling means comprising a stationary thermally conductive member positioned along said path, said member being spaced from said holder, means for controlling the temperature of said member, and liquid heat-transfer medium for thermally coupling said holder and said member while said holder advances along said path.

4,811,688

THERMOGRAPHIC PRINTING MACHINE FOR A ROLLER-SUPPORTED CONTINUOUS WEB

Arthur Turner, Weybridge, United Kingdom, assignor to Adana Limited, Feltham, United Kingdom

Filed Jan. 13, 1987, Ser. No. 3,044
Claims priority, application United Kingdom, Jan. 14, 1986, 8600779
Int. Cl.[4] B05C *11/00*
U.S. Cl. 118—674 **7 Claims**

1. A thermographic printing machine for passing therethrough continuous paper having an indefinite length, a width, a printed face and a non-printed reverse face, comprising:

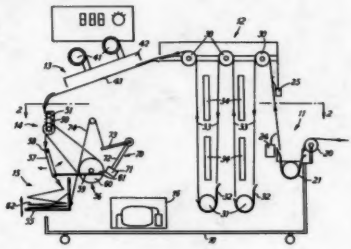
a powder applicator arranged for coating the printed face of the paper;

a plurality of spaced heaters each having opposite heater faces;

guide means for supporting the continuous paper in a sinuous path having a series of first locations of reversal and a series of second locations of reversal; said guide means including

a first roller at each said first location of reversal; each first roller having a surface arranged for engaging the continuous paper along its entire width on the reverse face thereof;

a second roller at each side second location of reversal; each said second roller having a surface arranged for engaging the continuous paper solely along opposite marginal zones on the printed face thereof; said continuous paper being trained alternatingly about the first and second rollers and positioned by said first and second rollers such as to pass



along each side of said heaters while presenting the printed side theretoward;

a cooling means for exposing said continuous paper to a cooling effect subsequent to an exposure of said continuous paper to heating by said heaters and

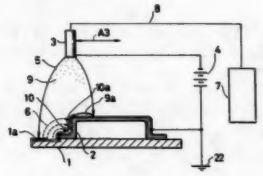
means for pulling said continuous paper consecutively through said powder applicator, said guide means and said cooling means.

4,811,689

ELECTROSTATIC POWDER COATING APPARATUS

Masahiro Yamamoto, Sakura; Mituyosi Kumata, Toyonaka; Katutoshi Kozoe, and Tsutomu Itoh, both of Tokyo, all of Japan, assignors to Onoda Cement Company, Ltd., Yamaguchi, Japan

Filed May 12, 1986, Ser. No. 862,036
Claims priority, application Japan, May 16, 1985, 60-104800
Int. Cl.[4] B05B *5/02*
U.S. Cl. 118—624 **4 Claims**

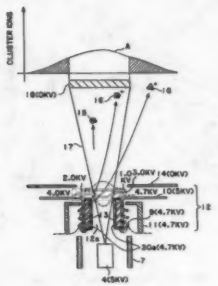


1. In an electrostatic powder coating apparatus having an electrostatic powder coating gun directed to an object to be coated, and a DC high voltage source connected between said gun and said object, said DC high voltage source forming a DC electric field between said gun and an object to be coated, the improvement comprising an auxiliary electrode provided in the vicinity of a desired coating surface of said object to produce an auxiliary electric field, whereby said auxiliary electrode is charged with the ionic current generated by said DC electric field in the same polarity as said gun, and said auxiliary electrode is provided on a surface of a belt conveyor supporting said object and facing the direction of said gun.

4,811,690
THIN FILM DEPOSITION APPARATUS

Yasuyuki Kawagoe; Kenichiro Yamanishi, and Seiji Yasunaga, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 25, 1988, Ser. No. 173,597
Claims priority, application Japan, Jun. 9, 1987, 62-142243
Int. Cl.[4] C23C *14/00*
U.S. Cl. 118—723 10 Claims

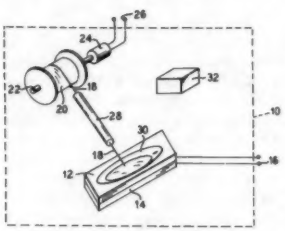


1. A thin film deposition apparatus comprising:
a vacuum chamber;
means for mounting a substrate within said vacuum chamber;
a vapor generating source for ejecting vapors of a substance to be deposited on said substrate into said vacuum chamber and thereby generating clusters in each of which a large number of atoms in said vapors are loosely combined;
an ionizing means for ionizing some of said clusters in an ionizing region of said chamber; and
an accelerating electrode for accelerating the ionized cluster ions and causing them to collide with said substrate to deposit a thin film;
wherein said ionizing means includes an ionizing filament for emitting thermoelectrons to ionize said clusters, and electron extracting electrode for accelerating said thermoelectrons toward said clusters, and an electron controlling electrode disposed opposite said electron extracting electrode from said filament for controlling the presence of the thermoelectrons in a central portion of said ionizing region.

4,811,691
WIRE FEED FOR METALIZING APPARATUS

Timothy L. McJilton, St. Charles, Ill., assignor to Shaped Wire, Inc., St. Charles, Ill.

Filed Feb. 24, 1987, Ser. No. 17,452
Int. Cl.[4] C23C *13/12*
U.S. Cl. 118—726 6 Claims

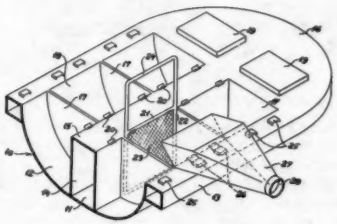


1. Metalizing apparatus comprising, in combination a heated boat, a source of metal in the form of a wire a guide tube for receiving and guiding said wire toward said boat, said guide tube comprising a hollow tube with interior dimensions larger than the dimensions of said wire, a means for feeding said wire longitudinally through said tube and toward said boat whereby the material of said wire is melted and vaporized, said wire comprising an elongate length of material having a generally rectangular cross-section.

4,811,692
METHOD OF EMPTYING A BARGE OF FISH AND A BARGE FOR USE IN THE PERFORMANCE OF THE METHOD

Kurt Malmbak-Kjeldsen, Jyderup, Denmark, assignor to Musholm Lax A/S, Denmark

PCT No. PCT/DK86/00037, § 371 Date Dec. 10, 1986, § 102(e) Date Dec. 10, 1986, PCT Pub. No. WO86/05946, PCT Pub. Date Oct. 23, 1986
PCT Filed Apr. 11, 1986, Ser. No. 10,192
Claims priority, application Denmark, Apr. 12, 1985, 1650/85
Int. Cl.[4] A01K *61/00*
U.S. Cl. 119—3 13 Claims



1. A method of emptying a barge of fish, said barge having a hull with transverse partitions which divide said barge into tanks, comprising moving a net-shaped scraper means having a width corresponding to a distance between an adjacent two of the partitions so that an outer edge of the scraper means substantially follos an inner side of the hull with constant change in the angle formed by the scraper means with a vertical plane, the moving including pivoting the scraper means at a top of one of the tanks so that the outer edge of the scraper means is movable up to an upper edge of the hull.

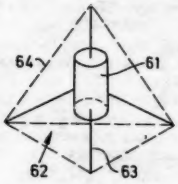
4,811,693
OBJECT FOR RECEIVING AND STORING USEFUL MEANS

Hans-Rudolf Müller, Zürich, Switzerland, assignor to Züricher Beuteltuchfabrik AG, Ruschlikon, Switzerland

Filed Feb. 13, 1987, Ser. No. 14,718
Claims priority, application Switzerland, Feb. 18, 1986, 649/86
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—15 12 Claims

1. An article adapted to be dispensed from aircraft onto large surface areas for the purpose of beneficially influencing the environment, said article comprising:
a hollow casing having at least one opening whereby when at least one item for producing such influence is stored in said casing, the item will be released through said at least one opening to the adjacent surface areas to initiate said influence after the casing is in landed position; and

means secured to said casing to prevent the casing when in landed position from being in direct contact with the



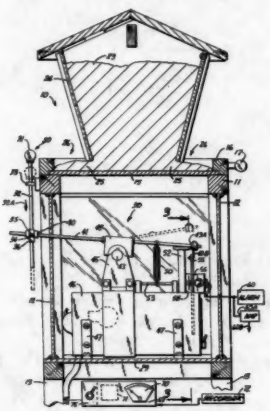
surface area, thus shielding the item from the adverse influence of local weather.

4,811,694

BIRD FEEDER WITH SCALE

Melvin L. Holmquist, 201 Happy Hollow Rd., Grand Rapids, Minn. 55744

Filed Mar. 24, 1987, Ser. No. 29,739
Int. Cl.[4] A01K *39/00*
U.S. Cl. 119—52 R **6 Claims**



1. In a bird feeder assembly having a frame, and a supply of bird feed thereon, with a station at which a bird may eat, the improvement comprising:

a perch member;

means coupled to said perch member for mounting the perch member to the feeder and to urge the perch member to a reference position, the means coupled being selected to permit the weight of a bird on the perch member to cause the perch member to move at a known relationship to the weight of the bird on the perch member;

scale means coupled to the perch member providing an output signal substantially proportional to the movement of the perch member for indicating the weight of a bird on the perch member, said scale means including a pivoting lever coupled to the perch member, and having a lever end that moves in a direct proportion to the amount of movement of the perch member when a bird alights thereon; and

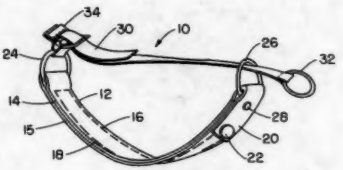
means coupled to said lever for providing an output voltage substantially proportional to the movement of the lever.

4,811,695

UNIVERSAL ANIMAL COLLAR

Ronald E. Higgins, Asheville, N.C., assignor to Ron-Li Corporation, Asheville, N.C.

Filed Jun. 18, 1987, Ser. No. 63,391
Int. Cl.[4] R01K *27/00*
U.S. Cl. 119—106 **2 Claims**



1. An improved animal collar comprising:

at least one elongated laminate; said laminate being curved to generally conform to the shpae of the animal's neck and is adapted to be received around a portion of the animal's neck;

means for providing resilience and stiffness for a portion of said collar; said means for providing resilience and stiffness contacting said at least one laminate; a strap connected to one end of said at least one laminate; eyelet means for slidably receiving a portion of said strap; said eyelet means connected to the other end of said at least one laminate;

attachment means connected to the other end of said strap; means for selectively connecting said attachment means to said at least one laminate whereby said collar may be used either as a choke collar or as a fixed circumference collar; said means for providing resilience and stiffness is an elongated leaf spring; said at least one laminate includes a pair of laminates attached to one another; said leaf spring located between said laminates; said attachment means is a first ring; said eyelet means is a second ring; said laminates are one continuous piece of material bent back on itself forming said pair of laminates; a third laminate being formed as a part of said continuous piece of material, said third laminate being connected to another one of the other laminates forming an open loop, said second ring adapted to be received in said open loop forming a fixed circumference collar.

4,811,696

BENT TUBE WASTE HEAT STEAM GENERATOR AND METHOD

Ralph G. Lacquement, and William L. Ruggles, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

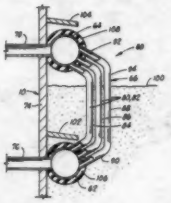
Filed Feb. 16, 1988, Ser. No. 156,482
Int. Cl.[4] F22B *1/00*
U.S. Cl. 122—4 D **32 Claims**

1. A regenerator apparatus comprising:

a shell portion containing spent catalyst from a catalytic reactor as a heat exchange medium; and

heat exchanger means containing another heat exchange medium and comprising:

upper manifold means;



lower manifold means; and

a plurality of substantially C-shaped tubes interconnecting said upper and lower manifold means.

4,811,697

INDUCTION SYSTEM WITH E.G.R.

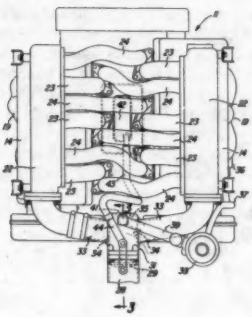
Toshio Kurahashi, Fukuroi, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Sep. 5, 1986, Ser. No. 904,510

Claims priority, application Japan, Sep. 24, 1985, 60-210515

Int. Cl.[4] F02M 25/06

U.S. Cl. 123—52 MV **17 Claims**



1. In an induction system for an internal combustion engine comprising a first plenum chamber, a first series of runners extending from said first plenum chamber to a first series of combustion chamber intakes, a second plenum chamber, a second series of runners communicating said second plenum chamber with a second series of runners communicating said second plenum chamber with a second series of combustion chamber intakes, a common air inlet for said plenum chambers communicating at one end with the atmosphere and having an outlet end, means for communicating said air inlet outlet end with each of said plenum chambers for introducing an air charge to the engine combustion chambers through said plenum chambers, a throttle valve in said common air inlet for controlling the flow of air into said plenum chamber, an exhaust system for receiving engine exhaust gases, and means for recirculating a portion of said engine exhaust gases back to said combustion chambers including an E.G.R. outlet discharging directly into said common air inlet.

4,811,698

VALVE TIMING ADJUSTING MECHANISM FOR INTERNAL COMBUSTION ENGINE FOR ADJUSTING TIMING OF INTAKE VALVE AND/OR EXHAUST VALVE CORRESPONDING TO ENGINE OPERATING CONDITIONS

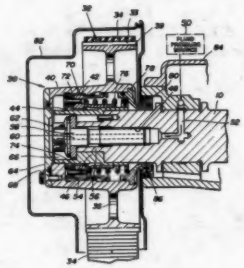
Akio Akasaka; Seiji Suga, and Takanori Sawada, all of Kanagawa, Japan, assignors to Atsugi Motor Parts Company, Limited, Atsugi, Japan

Filed May 21, 1986, Ser. No. 866,054

Claims priority, application Japan, May 22, 1985, 60-111115; Jun. 6, 1985, 60-123371; Jun. 28, 1985, 60-142996; Jun. 28, 1985, 60-142997; Apr. 24, 1986, 61-95335

Int. Cl.[4] F01L 1/34

U.S. Cl. 123—90.17 **10 Claims**



1. A valve timing adjusting mechanism for an internal combustion engine comprising:

a camshaft carrying a cam for driving one of an intake valve and an exhaust valve, said camshaft having a section formed with first helical gear teeth;

a cam pulley engaging a timing belt driven by the engine for rotation in synchronism with engine revolution, said cam pulley having second helical gear teeth;

a ring gear having inner and outer helical gear teeth engageable with said first and second gear teeth of said camshaft and said cam pulley;

first means for defining an enclosed chamber facing one planar face of said ring gear and connected with a fluid pressure source to receive pressurized fluid therefrom;

a spring means associated with the other planar face of said ring gear for exerting an initial biasing force on said ring gear in opposition to the force due to the pressure on said ring gear from said enclosed chamber; and

second means for controlling the fluid pressure introduced into said enclosed chamber in accordance with engine operating conditions so as to shift said ring gear between a first initial position, in which said camshaft and said cam pulley are in a predetermined first angular relationship with each other in which they drive said one of an intake valve and an exhaust valve at first timing relative to engine revolution, and a second position, in which said camshaft and said cam pulley are angularly displaced relative to each other to a second angular relationship in which they drive said one of an intake valve and an exhaust valve at second timing relative to engine revolution.

4,811,699

SPEED REDUCTION DEVICE

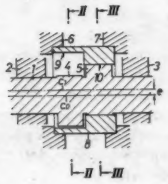
Kazuyuki Shiomi, and Takahiko Murata, both of Wako, Japan, assignors to Honda Giken Dabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1988, Ser. No. 149,648

Claims priority, application Japan, Jan. 28, 1987, 62-18026; Feb. 2, 1987, 62-22240

Int. Cl.[4] F01L *1/06*

U.S. Cl. 123—90.23 18 Claims



1. A speed reduction device comprising:

an eccentric cam having a central axis eccentrically offset from a central axis of a drive shaft and adapted to rotate about the central axis of said drive shaft in unison with said drive shaft; and

a driven shaft rotatably supported in eccentrically offset relation relative to said drive shaft by an eccentricity equal to that of said eccentric cam with respect to said drive shaft, said driven shaft having a pair of opposed surface portions on an inner peripheral surface defining a hollow portion, said opposed surface portions being engaged to rotate in a normally clamping and circumscribing relation to said eccentric cam as said drive shaft rotates.

4,811,700

SOUND INSULATED VEHICLE DRIVE UNIT

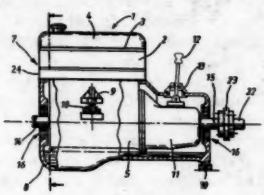
Ludwig Fricker, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 7, 1987, Ser. No. 105,287

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1986, 3634454

Int. Cl.[4] F02B *77/00*

U.S. Cl. 123—198 E 15 Claims



1. An arrangement for housing and supporting a vehicle drive unit of the type including a reciprocating piston-type internal combustion engine drivingly connected via its crankshaft to a transmission enclosed in a transmission casing connected directly at a cylinder housing of the engine, said arrangement comprising:

a noise insulating engine and transmission casing which encloses the engine from below the cylinder housing and extends upwardly to a level above the crankshaft, said engine and transmission casing also enclosing the entire transmission casing at a spacing therefrom to thereby form a unitary noise insulating capsule around sound generating parts of both the engine and the transmission casing while also forming an oil-sump for the transmission.

4,811,701

COATED VALVE FOR INTERNAL COMBUSTION ENGINE

Horst Bühl, Endersbach; Wolfgang Kleinekathöfer, Waldstetten, and Eggert Tank, Wernau, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 3, 1988, Ser. No. 201,894

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1987, 3719077

Int. Cl.[4] F01L *3/00*

U.S. Cl. 123—188 AA 8 Claims

1. Coated valve for internal combustion engine, comprising:

a valve;

a deposit preventing layer disposed over at least a portion of said valve, said deposit preventing layer including at least 90% by weight of cerium (IV) oxide.

4,811,702

INTAKE PORT FOR INTERNAL COMBUSTION ENGINES

Alfred L. Oppie, and Peter Samish, both of 11349 Orcas Ave., Lakeview Terrace, Calif. 91342

Filed Mar. 11, 1988, Ser. No. 166,891

Int. Cl.[4] F02B *75/18*

U.S. Cl. 123—188 M 2 Claims

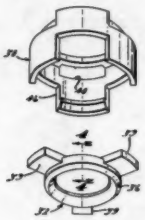
1. An intake port for an internal combustion engine the device comprising,

a substantially straight through intake port having an airfoil form located within said intake port,

said airfoil form faring into being integral with the intake port at its perimeter,

a push-rod and guide passing through the interior of said airfoil form.

4,811,703
VALVE STEM SEAL
Brian F. Rericha, Downers Grove, and Bernard G. Stritzke, Hanover Park, both of Ill., assignors to Microdot Inc., Darien, Conn.
Filed Mar. 14, 1988, Ser. No. 167,736
Int. Cl.[4] F01L 3/08
U.S. Cl. 123—188 P 2 Claims

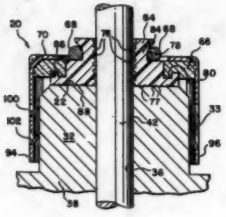


1. A fixed valve stem oil seal for piston-type internal combustion engine comprising

a cup-shaped case having a radially extending flange with a central aperture for the acceptance of a valve stem and an axially extending portion positively engageable with a valve guide, and

a seal element disposed between the radial flange on said case and said valve guide and radially movable relative thereto, said seal element comprising an elastomeric "O-ring" having a first sealing surface engageable with the valve stem, a second sealing surface engageable with the radial flange on said case and a third sealing surface engageable with an upper radial surface of said valve guide so as to effect a seal between said valve and said valve guide.

4,811,704
VALVE STEM SEAL
Dennis A. Boehmer, Xenia, and Floyd V. Edwards, Yellow Springs, both of Ohio, assignors to Vernay Laboratories, Inc., Yellow Springs, Ohio
Filed Mar. 7, 1988, Ser. No. 164,690
Int. Cl.[4] F01L 3/08
U.S. Cl. 123—188 P 17 Claims



1. In combination with an engine cylinder head, valve guide boss means projecting upwardly from said cylinder head and having an upper surface and cylindrical side surface, a valve guide formed in said cylinder head, means defining an opening in said boss means substantially aligned with said valve guide, a valve stem slidably received in said valve guide and boss means opening, and a valve stem seal including an annular elastomeric portion having an internal wall defining and opening therethrough substantially aligned with said boss means opening and said valve guide and receiving said valve stem, the improvement comprising:

said elastomeric portion being seated solely on said upper surface of said boss means above said side surface thereof,

means associated with an upper section of said elastomeric portion biasing said internal wall into fictional engagement with said valve stem,

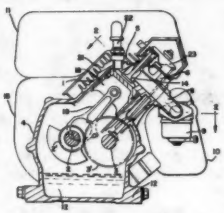
an annular insert formed of a rigid material relative to said elastomeric portion,

said insert and an outer portion of said elastomeric portion being complementarily configured and in interlocking relationship with each other, and

retaining means having a central portion, means defining an opening through said central portion and a depending, boss means-engaging portion,

said retaining means being received over said boss means with said boss means-engaging portion in engagement with said boss means side wall and said elastomeric portion and insert captured between said retaining means and said boss means upper surface.

4,811,705
HORIZONTAL-SHAFT OHV ENGINE
Hiromi Ono, Akashi, and Tetsuaki Shirai, Kobe, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan
Filed Jan. 19, 1988, Ser. No. 145,558
Claims priority, application Japan, Jan. 22, 1987, 62-7777[U]
Int. Cl.[4] F02F 7/00
U.S. Cl. 123—195 AC 7 Claims



1. An overhead valve engine comprising an engine housing having a bottom mounting portion, a horizontal crankshaft and a camshaft rotatably mounted in said housing, said camshaft being in driven engagement with said crankshaft, said camshaft having a pair of cams thereon, said camshaft extending in parallel with and at substantially the same height above said bottom mounting portion as said crankshaft, an output shaft extending from one of said crankshaft and said camshaft, a cylinder formed in said housing and a cylinder head on top of said cylinder, an intake valve and an exhaust valve both provided in said cylinder head and leading to said cylinder, said cylinder extending upwardly from said mounting portion and being inclined at approximately 45 degrees toward and extending over said camshaft, a pair of push rods extending substantially in parallel with said cylinder and extending through said cylinder head, said rods being reciprocatable by engagement with cams on said camshaft to operate said intake and exhaust valves, an air intake port formed in said cylinder head and connected to said intake valve, said port extending between said push rods substantially perpendicularly to said crankshaft, a carburetor connecting with said intake port through a curved inlet manifold such that said carburetor is positioned substantially in parallel with said crankshaft, and an air cleaner connected to said carburetor and adjacent to said carburetor on the side of said carburetor which is opposite said output shaft.

4,811,706

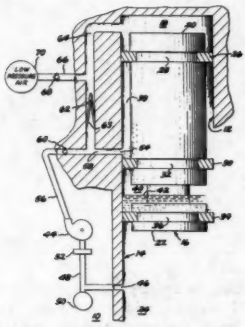
PRESSURIZED BALANCED SEALING SYSTEM FOR USE ON THE RING-LINER INTERFACE OF A COAL FIRED DIESEL ENGINE

Gary L. Leonard, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 22, 1988, Ser. No. 158,433

Int. Cl.[4] F01M *1/00*

U.S. Cl. 123—196 R **24 Claims**



1. A system for minimizing wear to a reciprocating internal combustion engine comprising:

a cylinder having a wall and a combustion chamber within the cylinder;

a piston movable in a stroke within the cylinder between a top dead center position and a bottom dead center position, said piston having first and second ends, said first end being adjacent to said combustion chamber and said second end being remote from said combustion chamber;

first, second, and third piston rings extending around said piston, said second piston ring being positioned between the first and the third piston rings;

a ring pack area on said piston between said first piston ring and said second piston ring;

a lubricant blowby area between said second piston ring and said third piston ring; and

a pump communicating with an inlet in said wall such that said lubricant blowby area registers with said inlet during at least part of the stroke of the piston, said pump having an outlet in said wall such that said ring pack area registers with said outlet during at least part of the stroke of the piston, said pump operable to draw lubricant from said lubricant blowby area and provide lubricant to said ring pack area.

4,811,707

METHOD OF OPERATING CATALYTIC IGNITION ENGINES AND APPARATUS THEREFOR

William C. Pfefferle, 51 Woodland Dr., Middletown, N.J. 07748

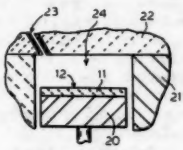
Division of Ser. No. 526,530, Aug. 26, 1983, Pat. No. 4,646,707, which is a continuation-in-part of Ser. No. 249,075, Mar. 30, 1981, abandoned. This application Dec. 8, 1986, Ser. No. 895,468

Int. Cl.[4] F02B *51/02*

U.S. Cl. 123—272 **3 Claims**

1. A method of facilitating ignition of fuel injected into compressed air in a cyclic ignition engine combustion chamber at a time near maximum compression solely by contact with a catalyst heated to a temperature high enough to vaporize fuel droplets and ignite vaporized fuel which comprises;

applying a ceramic insulating coating of at least 1 mil thickness having a melting point greater than 3500° F., to at least 15% of the inner surface of said combustion chamber, followed by application of a coating of an oxidation catalyst to said insulating coating , said catalyst being a vaporized fuel ignition catalyst selected from the group



consisting of a noble metal, cobalt, nickel and a perovskite catalyst.

4,811,708

COMBUSTION SPACE FOR A RECIPROCATING PISTON INTERNAL COMBUSTION ENGINE

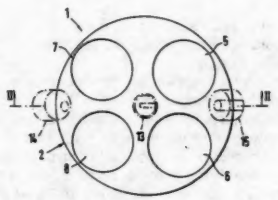
Dusan Gruden, Ditzingen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jan. 29, 1988, Ser. No. 150,012

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1987, 3702899

Int. Cl.[4] F02B *23/10*

U.S. Cl. 123—299 **9 Claims**



1. A combustion space for a reciprocating piston internal combustion engine which is provided between a cylinder head and a piston and is equipped with ignition and plural injection means, the gas-exchange control in the combustion space taking place by two inlet valves and two exhaust valves of the cylinder head, the ignition means extending in a center longitudinal axis of the cylinder, each injection means extending essentially at an identical angle to the center longitudinal axis of the cylinder, the piston including on the side facing the cylinder head a substantially spherically shaped recess whose radius lies substantially on the center longitudinal axis of the cylinder, and the piston extending on the side facing the cylinder head outside of the recess up to a roof-shaped combustion space boundary of the cylinder head for the formation of a squeeze area.

4,811,709

FUEL INJECTION PUMP

Wolfgang Braun, Ditzingen; Wulf Emsmann, Gerlingen; Karl Konrath, Freiberg; Klaus Krieger, Affalterbach, and Heinz Nothdurft, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 26, 1988, Ser. No. 148,588

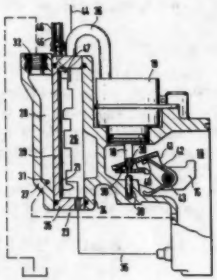
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1987, 3703073

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—357 **4 Claims**

1. A fuel injection pump for an internal combustion engine having an intake manifold, said pump comprising, in combination:

(a) a fuel pump housing;
(b) a fuel pump, arranged in said housing, for supplying an injectable quantity of fuel at an injectable pressure to a plurality of passive fuel injectors, said fuel pump having means for adjusting said injectable fuel quantity;
(c) a casing mounted on said fuel pump housing including:
(1) a cooling chamber, having an inlet and outlet to facilitate the flow of fuel therethrough; and
(2) a control chamber, separated from said cooling chamber by a heat transfer wall;
(d) a vacuum line connected between said intake manifold and said control chamber;
(e) a pressure sensor disposed in said control chamber and



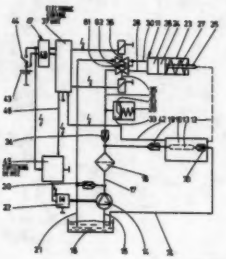
connected to said vacuum line, for producing a first signal representative of the manifold pressure of the internal combustion engine;
(f) an engine speed sensor for producing a second signal representative of engine speed;
(g) electrical control means located in said control chamber in heat conductive relationship with said heat transfer wall, for producing an electrical control signal in dependence upon said first and second signals;
(h) a mechanical governor, having a full-load stop and an intermediate lever for controlling said fuel quantity adjusting means; and
(i) a stepper motor for adjusting said intermediate lever in response to said control signal.

4,811,710
FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Alfred Schmitt, Ditzingen; Gerhard Stumpp, Stuttgart; Dietrich Trachte, Leonberg, and Wolf Wessel, Oberriexingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 18, 1988, Ser. No. 220,278
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1987, 3725088
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—359 **25 Claims**

1. A fuel injection pump for internal combustion engines, in particular an in-line injection pump for diesel engines, comprising a hydraulic control mechanism for actuating a governor rod that controls the injection quantity, said hydraulic control mechanism including a control cylinder, a control piston displaceable in said control cylinder, said control piston defining a control chamber therewithin, a restoring spring disposed in said control mechanism adapted to force said control piston in a displacement direction reducing a control chamber volume, first and second electric switching valves controllable by an electronic valve control unit, said first and second electric switching valves being closed if without current supply, one of said switching valves being disposed in an inflow line communicating with a pressurized fuel reservoir connected to said control chamber and the other of said switching valves being disposed in a return line leading from said control chamber to communicate with a fuel tank, a fuel pump suction chamber, a fuel feed pump connected to said fuel tank for filling said fuel pump suction chamber with fuel, said pressurized fuel reservoir (29) being connected via a pressure line (31) to a pressure-side outlet of said feed pump (14), said feed pump (14) being driven electrically by a feed pump drive motor, switch means

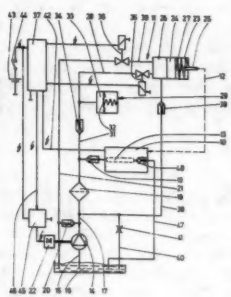


being provided for controlling a current supply for said valve control unit (37) and for said feed pump drive motor, said switch means operating synchronously with an arbitrarily actuatable switch (44) for switching the engine on and off, said control chamber (26) of said control mechanism (11) being arranged to communicate with said fuel tank (16) via a relief control device (47) operative at least upon an actuation of said actuatable switch (44) to effect a shutoff of said engine.

4,811,711
FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Gerhard Stumpp, Stuttgart, and Wolf Wessel, Oberriexingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 29, 1988, Ser. No. 212,997
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1987, 3725089
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—359 **10 Claims**



1. A fuel injection pump for internal combustion engines, in particular an in-line injection pump for Diesel engines, having a fuel quantity governor, an electrically driven feed pump communicating on an intake side with a fuel tank and communicating on a pressure side via a pressure line with a pump suction chamber for filling said suction chamber with fuel from the fuel tank, an emergency shutoff device adapted to respond to a malfunction in the governor, in particular to a persistent control deviation, by generating a switching signal, a check

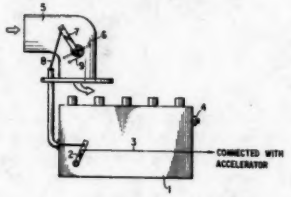
valve (19) having a forward flow direction oriented toward the suction chamber (13) being disposed in the pressure line (17) between the feed pump (14) and the suction chamber (13), the switching signal of the emergency shutoff device (45) triggering a shutoff of the feed pump drive (22).

4,811,712

AIR INTAKE APPARATUS FOR USE IN DIESEL ENGINE

Koichiro Itow, Oyama, Japan, assignor to Kabushi Kaisha Komatsu Seisa Kusho, Tokyo, Japan

Filed Jan. 12, 1987, Ser. No. 2,216
Claims priority, application Japan, Jan. 17, 1986, 61-006552
Int. Cl.[4] F02D *1/04, 9/02*
U.S. Cl. 123—399 **6 Claims**



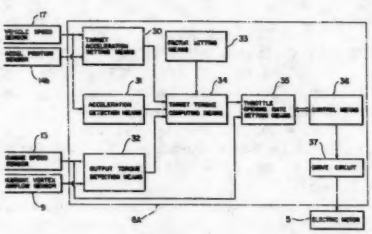
1. An air intake apparatus for use in a spark-assisted diesel engine, comprising a throttle valve mounted in an air intake connector connected with an air intake system of the diesel engine, and a throttle valve actuator means connected with a fuel regulating mechanism of the engine so that the throttle valve may be actuated or turned in the direction of throttling when the engine is operating under a partial load condition, wherein said throttle valve actuator means comprises a throttle lever fixedly secured to said throttle valve, a length of wire connecting the throttle lever with said fuel regulating mechanism of the engine, and spring means for biasing said throttle valve toward a closed position, so that said throttle valve may be actuated or turned in the direction of throttling when the engine is operating under a partial load condition.

4,811,713

VEHICLE ENGINE CONTROLLER

Makoto Shimada, Kyoto, Japan, and Takashi Dogahara, Farmington Hills, Mich., assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1987, Ser. No. 113,523
Claims priority, application Japan, Oct. 31, 1986, 61-260530
Int. Cl.[4] F02D *41/10, 9/02*
U.S. Cl. 123—399 **15 Claims**



1. A controller for a vehicle engine mounted on a vehicle and adapted to generate power to drive the vehicle, comprising:

a throttle valve interposed in an intake passage of the engine so as to control the power of the engine;

an actuator for driving the throttle valve so as to control the opening rate of the throttle valve;

a man-controlled operation member for controlling the power of the engine;

a means for detecting the degree of operation of the man-controlled operation member;

a means for receiving as an input detection results from the operation-degree detecting means and then setting a target acceleration corresponding to the degree of operation of the man-controlled operation member;

a means for detecting a running acceleration of the vehicle;

a means for detecting a revolution number of the engine;

a means for detecting an output torque of the engine;

a target torque computing means for determining a target torque from a predetermined functional relation by using the target acceleration, running acceleration and output torque as input information;

a means for setting a desired target throttle opening rate determined by the target torque and engine revolution number; and

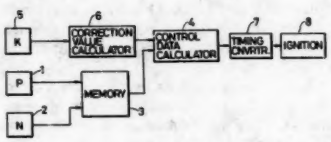
a control means for receiving the target throttle opening rate from the throttle opening rate setting means and outputting a control signal to the actuator so as to achieve the target throttle opening rate.

4,811,714

IGNITION TIMING CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINE

Masahira Akasu, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1984, Ser. No. 592,209
Claims priority, application Japan, Mar. 22, 1983, 58-48181; Apr. 22, 1983, 58-71717; Jun. 2, 1983, 58-99778
Int. Cl.[4] F02D *5/15*
U.S. Cl. 123—425 **1 Claim**



1. An ignition timing control device for an engine, comprising:

knock detecting means for detecting knocking of said engine;

an operating condition sensor for sensing predetermined operating conditions of said engine;

memory means in which reference control values for providing reference ignition timing characteristics are stored at addresses determined in correspondence to said operating conditions, an output of said operating condition sensor being applied to an address input of said memory means to read out one of said reference control values;

discriminating means for discriminating in response to an output of said knock detecting means whether or not engine knocking has occurred;

means for producing an ignition timing correction factor by increasing or decreasing a previous value according to an output of said discriminating means, said correction factor being greater than, equal to, or less than 1; and

means for determining ignition timing of said engine in accordance with a control value obtained by multiplying or dividing said one of said reference control values thus read out by said correction factor, said determining means comprising means for selectively decrementing, maintaining unchanged, or incrementing said one of said reference

control values, depending on whether said correction factor is greater than, equal to, or less than 1,

ones of said correction factor for an operating condition where a reference ignition timing lags an optimum ignition timing of a knock limit of said engine and for an operating condition where a reference ignition timing leads said optimum ignition timing of said knock limit being of opposite magnitudes.

4,811,715

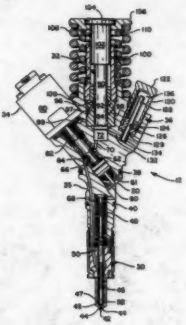
ELECTRONIC UNIT INJECTOR

Ilija Djordjevic, Windsor; William W. Kelly, Granby, and Richard E. Vanderpoel, Bloomfield, all of Conn., assignors to Stanadyne, Inc., Windsor, Conn.

Filed Nov. 2, 1987, Ser. No. 115,845

Int. Cl.[4] F02M *34/00*

U.S. Cl. 123—447 **17 Claims**



1. An electronic unit injector comprising: injector body means for forming a fuel inlet, an injector chamber and an inlet passage connecting said fuel inlet and said injector chamber;

nozzle means for defining a nozzle chamber in fluid communication with said injector chamber, discharge orifice means and a valve seat;

needle valve means including a needle valve mounted in said nozzle means and axially displaceable in response to pressure above a first pre-established threshold in said nozzle chamber from a closed position wherein the needle valve engages the valve seat to prevent the discharge of fuel through said orifice means to an opened position wherein fuel in said nozzle chamber is discharged through said orifice means;

plunger means including a plunger displaceable in said injector chamber for pressurizing fuel therein;

expandable chamber means comprising means defining an expandable subtraction chamber in fluid communication with said injector chamber during the pressurization of fuel by said plunger means and means for expanding the volume of said subtraction chamber as the pressure in said subtraction chamber increases between second and third threshold pressures; and

solenoid valve means mounted to said body means and actuable between first and second positions for selectively controlling fluid communication through said inlet passage wherein in the first position fuel communicates from said inlet passage to fill and spill said injector chamber and in a second position fuel communication between said inlet passage and injector chamber is terminated and said plunger is displaceable to pressurize fuel in said injector chamber so that when fuel in said nozzle chamber exceeds said first threshold pressure, fuel is discharged through said discharge orifice means in substantially a two-phase fuel injection rate sequence which is terminated by actuating said solenoid valve means to said first position.

4,811,716

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

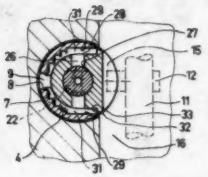
Josef Güntert, Gerlingen, and Johann Warga, Bietigheim-Bissingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 5, 1987, Ser. No. 104,027

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1986, 3633899

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—503 **6 Claims**



1. A fuel injection pump for internal combustion engines comprising a housing (1), a cylinder liner (2) in said housing, a piston (3) operative in said cylinder liner (2), a pump work chamber (18) formed by said cylinder liner and said pump piston, a control slide (5), surrounding a portion of pump piston (3) which serves to provide fuel control via a radial bore opening (26) having control edge (27) disposed in said control slide (5) and is axially displaceable in a recess (4) provided in the cylinder liner, a radial fuel flow entrance (6), is disposed in said recess (4), said recess forming a radial three-dimensional gap (31) for fuel guidance between the control slide (5) and a wall (29) of said recess (4);

a control opening including an oblique groove (22) and a recess (23) provided on a jacket face of the pump piston (3) which communicates with the pump work chamber (18) through a relief conduit (24, 25) extending in the pump piston (3), in which said control opening may be uncovered by the control slide (5) in order to terminate an injection, and which cooperates with said control edge (27) of the control slide (5) in such a way that a diverted stream strikes said wall (29) of the recess (4);

a pump suction chamber (16), disposed in the pump housing (1), into which chamber (16) said fuel flow entrance (6) of the recess (4) discharges, aprons (32) on the control slide in the vicinity of the entrance (6) of the recess (4) for at least partially covering said radial three-dimensional gaps which extend toward said pump suction chamber (16); and

each of said aprons (32) have one face (33) extending at right angles toward said gap, said faces present on shoulders that widen said control slide (5) in the area of the gap.

4,811,717

DEVICE DRIVING INJECTION PUMP FOR FUEL-INJECTION ENGINE

Ryoji Nakahama, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jan. 21, 1987, Ser. No. 5,602

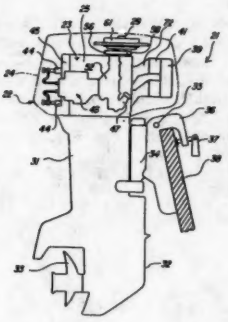
Claims priority, application Japan, Feb. 12, 1986, 61-26893

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—509 **22 Claims**

1. In a fuel injection system for an internal combustion engine having an output shaft rotating about a vertically extending axis and at least two horizontally extending in line cylinders, a fuel injection pump having a drive shaft, and means for driving said fuel injection pump drive shaft from said engine output shaft, the improvement comprising said fuel injection

pump drive shaft being rotatable about a horizontally extending axis disposed between the upper end lower ends of said



engine for maintaining substantially equal length delivery lines to each of said cylinders.

4,811,718

FUEL SUPPLY SYSTEM FOR INTERNAL COMBUSTION ENGINE

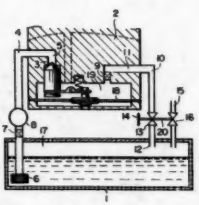
Satoshi Sonoda, Tokyo, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed May 24, 1988, Ser. No. 198,694

Claims priority, application Japan, Jun. 4, 1987, 62-138896

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—517 **2 Claims**



1. A fuel supply system for an internal combustion engine having a fuel supply passage for supplying fuel from a fuel tank to a carburetor of the internal combustion engine, a suction pump adapted to be operated at the time of start-up of the engine and adapted to suck the fuel into the carburetor through the fuel supply passage, a fuel return passage for allowing excessive fuel in the carburetor to be returned to the fuel tank, and a normally closed release valve disposed in the fuel return passage and adapted for opening the fuel return passage when the engine is started up, said fuel supply system characterized in that said suction pump is disposed in the fuel supply passage and in that a normally closed ventilation valve is disposed in a ventilation passage and is operatively connected to the release valve so that the ventilation valve and the release valve are opened and closed simultaneously.

4,811,719

FUEL PREHEATER

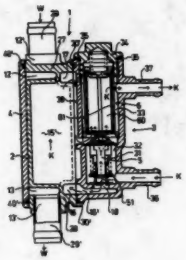
Dieter Baumann, Greven-Gimbte, Fed. Rep. of Germany, assignor to Ing. Walter Hengst GmbH & Co. KG, Muenster, Fed. Rep. of Germany

Filed Apr. 23, 1987, Ser. No. 41,717

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1986, 3630084

Int. Cl.[4] F03M *31/16*

U.S. Cl. 123—557 **4 Claims**



1. Fuel preheater, especially for use in diesel engines of motor vehicles, in which the fuel as first fluid medium is heated by absorption of heat from a second fluid medium of higher temperature, and in which the two media are carried through the preheater in separate passages, comprising:

a core which has a set of walls of meandering cross section which forms two groups of parallel passages opening alternately on one longitudinal side and the other longitudinal side and running between the individual walls of the set, the passages of one group being all open on the same side,

two covers with the core disposed therebetween and covering the open longitudinal sides of the passages,

an inlet from the outside,

in at least one of the core and the covers a distributor passage for each of the two media, connecting together the passages of one group at an end side to said inlet form the outside, and a collecting passage having an outlet to the outside,

at least on a portion of the walls, core ribs running substantially perpendicular to the direction of flow of the particular medium and projecting into the interior of the passages, the ribs being of smaller length than the width of the passages,

the core being made of at least one of pressure-cast aluminum and an aluminum alloy, and,

in at least one of the two covers and the core, a fuel inlet and a fuel outlet and a bypass and a thermostatic valve conducting the fuel according to its entry temperature at least partially through said bypass.

4,811,720

FUEL SUPPLY SYSTEM FOR GASEOUS FUEL OPERATED VEHICLE AND REGULATOR THEREFOR

Shoji Katumata, Gotenba, and Shunichi Kondo, Okazaki, both of Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Toyota and Toyota Jidosha Kabushiki Kaisha, Ohbu, both of, Japan

Filed Dec. 12, 1986, Ser. No. 941,103

Claims priority, application Japan, Dec. 16, 1985, 60-281035; Dec. 18, 1985, 60-283004; Jan. 23, 1986, 61-011072

Int. Cl.[4] F02B *43/00*; F02G *5/00*

U.S. Cl. 123—527 **1 Claim**

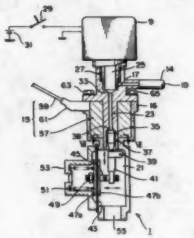
1. A regulator for a gaseous fuel operated vehicle engine, comprising:

a high pressure housing defining therein a high pressure gas

passage and a valve chamber, said passage having one end thereof connectible to a high pressure conduit for introducing high pressure gaseous fuel thereinto and the other end thereof opening to said valve chamber;

a low pressure housing fixedly mounted to said high pressure housing, said low pressure housing defining therein a decompression chamber;

valve means mounted in said valve chamber for selectively opening and closing said other end of said high pressure gas passage in response to the gas pressure in said decompression chamber;



means for moving said valve means in response to the gas pressure in said decompression chamber, said moving means including a diaphragm disposed parallel with the flow of gaseous fuel through said decompression chamber;

fuel cutoff valve means mounted in said high pressure gas passage for cutting off the supply of high pressure fuel gas when the engine is at rest or at a time of emergency; and

PTC heater means located around said valve means and adjacent to said fuel cutoff valve means for heating both, said PTC heater means having an electric resistance with a positive temperature coefficient.

4,811,721

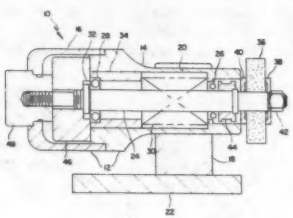
WHEEL DRESSER

Walter R. Altfather, P.O. Box 154, Ekastown Rd., Sarver, Pa.

Filed Jun. 22, 1987, Ser. No. 65,278

Int. Cl.[4] B24B *53/00*

U.S. Cl. 125—11 CD **14 Claims**



1. A wheel dresser for dressing and truing a driven grinding wheel, comprising:

a housing;

a shaft rotatably mounted in said housing; a dressing wheel substantially nonrotatably affixed to said shaft; and

rotatable dressing control knob means for rotating with said dressing wheel and for enabling operator supplied digital manipulation so as to initiate acceleration and rotation of said dressing wheel and said shaft prior to contact of said dressing wheel with said driven grinding wheel and for thereafter enabling operator supplied digital manipulation of said rotatable dressing control knob means so as to apply a selectively variable braking action against rotation of said dressing wheel by said driven grinding wheel.

4,811,722

PROCESS FOR SHARPENING CUTTING-OFF TOOLS AND CUTTING-OFF PROCESS

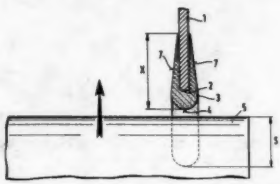
Gerhard Brehm, Emmerting, and Johann Niedermeier, Burghausen, both of Fed. Rep. of Germany, assignors to Wacker Chemitronics GmbH, Munich, Fed. Rep. of Germany

Filed May 5, 1988, Ser. No. 190,496

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1987, 3718947

Int. Cl.[4] B24B *53/00*

U.S. Cl. 125—11 R **6 Claims**



1. In a process for sharpening a cut-off tool for cutting off slices or wafers from work-pieces, the cut-off tool having a cutting layer which is applied to the cutting edge and has a bonded cutting grain, wherein the cut-off tool is sharpened by sawing into a solid sharpening substance, the improvement which comprises: during the sharpening, providing an oscillating movement, transverse to the cutting edge, between the cutting edge and the solid sharpening substance, during the period in which the cutting layer of the cutting edge penetrates into the solid sharpening substance.

4,811,723

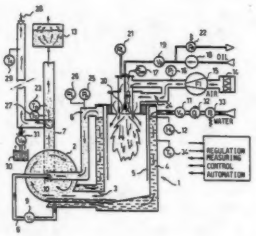
METHOD AND A DEVICE FOR THE GENERATION OF HOT AIR

Raimo Viänänen, Tampere, Finland, assignor to Partek Corporation, Helsinki, Finland

Filed Feb. 3, 1987, Ser. No. 10,218

Int. Cl.[4] F24H *3/14*

U.S. Cl. 126—113 **10 Claims**



1. In a method of generating hot air by generating hot gases in a heating space and adding water to said hot gases such that said added water is evaporated and mixed with said hot gases, the improvement wherein said hot gases are passed from said heating space into a whirl chamber having a horizontal central axis and a periphery zone therein and brought into a whirling motion around said horizontal central axis inside said whirl chamber, wherein said water is fed into said whirl chamber at an inlet position proximal to said horizontal central axis such that said water becomes mixed with said hot gases while said hot gases are displaced to said peripheral zone by said whirling

motion of said gases and is evaporated by heat energy of said hot gases, and wherein said mixture of water and hot gases is discharged from said whirl chamber through an outlet position proximal to said horizontal central axis and opposite from said inlet position.

5. A device for generating hot air comprising

a heating space for generating hot gases therein,

a whirl chamber having a horizontal central axis, a peripheral zone, a water inlet which opens into said whirl chamber near said horizontal central axis for supplying water into said whirl chamber and an outlet opening for a discharge conduit for discharging a mixture of evaporated water and hot gases therethrough from said whirl chamber, said outlet opening and said water inlet being opposite from each other with respect to said whirl chamber, and

a connecting pipe connected to said heating space and to said peripheral zone of said whirl chamber for bringing hot gases from said heating space into a whirling motion around said horizontal central axis inside said whirl chamber.

4,811,724
AIR EXHAUSTING MEANS

Erkki Aalto, Kausala; Kaarlo Korhonen, Kouvola; Jorma Pekkinen, Kausala; Esa Sundberg, Kausala; Arvi Tolmunen, Kausala; Seppo Vartiainen, Kouvola, and Reijo Villikka, Kausala, all of Finland, assignors to Halton Oy, Finland

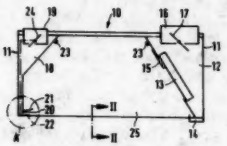
PCT No. PCT/F185/00076, § 371 Date Dec. 5, 1986, § 102(e) Date Dec. 5, 1986, PCT Pub. No. WO86/06154, PCT Pub. Date Oct. 23, 1986

PCT Filed Sep. 13, 1985, Ser. No. 10,277

Claims priority, application Finland, Apr. 12, 1985, 851477

Int. Cl.[4] F24C *15/20*

U.S. Cl. 126—299 D **30 Claims**



1. Air exhausting device, intended e.g., for catering industry kitchens or equivalent, said air exhausting device comprising

an outer housing,

an exhaust chamber with at least one filtering unit within said outer housing,

a collecting chamber for gaseous impurities within said outer housing,

a blow chamber within said outer housing

separate blow apertures of said blow chamber of the air exhausting device disposed to deliver a blow jet which induces a secondary air jet, said secondary air jet arranged on all sides of said blow apertures to exert an effect in its entirety in a proximity effect area, and

a control baffle disposed above and in the vicinity of said blow apertures of said blow chamber,

said control baffle arranged to direct said blow jet towards said filtering unit so that a maximally efficient ejection effect of said blow jet in the proximity effect area and maximal starting impulse are achieved,

said impulse being arranged to die out substantially before arriving at said filtering unit.

4,811,725
EXTRACORPOREAL LITHOTRIPSY APPARATUS

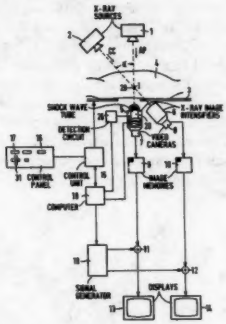
Franz Grasser, Eggolsheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 30, 1987, Ser. No. 115,046

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643976

Int. Cl.[4] A61B *17/22*

U.S. Cl. 128—24 A **11 Claims**



1. An extracorporeal lithotripsy apparatus for disintegrating a calculus in the body of a patient comprising:

means for positioning said patient so that said calculus is disposed at a known location in space;

means for generating shock waves focussed at a focus, said means for generating shock waves having a region surrounding said focus effective for disintegrating said calculus, and said means for generating shock waves having a deformable portion adapted to be pressed against and conformable to a portion of the body of said patient, and a rigid portion;

means for monitoring the position of said means for generating shock waves;

means connected to said means for positioning and to said means for monitoring for moving said means for generating shock waves to press said deformable portion against said body to bring said said focus into substantial coincidence with said known location;

means for sensing between said body and said rigid portion of said means for generating shock waves and for interrupting operation of said means for moving to cease movement of said means for generating shock waves upon the occurrence of said contact; and

computer means with data identifying said effective region entered therein connected to said means for positioning and to said means for moving for calculating whether the calculus is within said effective region when said movement of said means for generating shock waves ceases.

4,811,726
DEVICE FOR MANUALLY MASSAGING THE CUTANEOUS COVERING

Antonin Goncalves, Groslay, and Philippe Osmond, Aulnay-la-Riviere, both of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 73,254, Jul. 14, 1987. This application May 26, 1988, Ser. No. 199,059

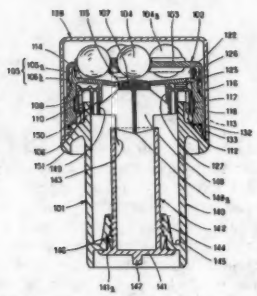
Claims priority, application France, Jul. 21, 1986, 86 10531; Sep. 10, 1986, 86 12653

Int. Cl.[4] A61H *15/00;* **B67D** *3/00*

U.S. Cl. 128—57 **10 Claims**

1. In a device for manually massaging the cutaneous covering simultaneously with application thereto of a liquid or pasty product, said device comprising:

(a) reservoir means containing the product to be applied;
(b) applicator means including ball means, housing means holding said ball means, and means to said housing means defining at least one opening on the side nearer the reservoir means for admitting the product to be applied from the reservoir means to the internal volume of said housing means; and
(c) obturator means between the reservoir means and said applicator means;
the improvement wherein:
(d) said obturator means comprises
(da) a first movable obturator part, said first obturator part including a central strip and means defining at least one opening to allow the product to be applied to pass through said first obturator part, and
(db) a second actuating obturator part, said second obturator part comprising a disc, means defining a central hole in said disc, and a skirt extending downwardly from said disc and surrounding at least said first obturator part;
(e) said applicator means includes means releasably fixing it to said second obturator part;



(f) said first and second obturator parts comprise cooperating means to ensure relative displacement between said first and second obturator parts to a first relative position in which said central stud closes said central hole and a second relative position in which the central hole is completely freed; and
(g) said cooperating means of said first and second obturator portions are operative to pass in a continuous movement from said first relative position to said second relative position;
wherein the reservoir means comprise a detachable container; wherein said device includes a shell which has one end closed by a bottom integral with said detachable container; wherein there are rupturable cover means closing said detachable container to contain the product to be applied; wherein the other end of said shell has a free edge cooperating with the applicator means and the obturator means; and wherein the obturator means comprises means for rupturing said cover means.

4,811,727
RETENTION STOCKING FOR LOWER LIMB
Abel Etienne, 29, rue des Carrieres, 57050 Plappeville, France
Filed Sep. 23, 1986, Ser. No. 910,603
Claims priority, application France, Sep. 26, 1985, 85 14412
Int. Cl.[4] A61L *3/00*
U.S. Cl. 128—80 R **17 Claims**

1. A therapeutic retentive stocking for support of the anatomo-pathological axis of the leg, said axis defined by the plantar arch, the Achilles tendon, the ischiatic leg muscles, the adductors, the pubis, the dorso-lumbar hinge joint, and the pelvis, and for the concomitant functions of maintenance, support, relief, compensation, protection, and reinforcement of the operation of the muscular, articular, vascular, and tendinous systems, comprising:
(a) a leg segment having an upper portion and a lower portion;
(b) a foot segment;
(c) a fabric of flexible, elastic, non-constricting fibers, said fabric having an inner surface;
(d) a closed end and an open end, said closed end adapted to completely enclose the toes, and said open end defining an upper circumference adapted to surround the leg from the juxtaratolian front to the lower part of the upper triangle of the popliteal hollow;
(e) a lining attached to said inner surface of said fabric, said lining comprising a fabric of smooth, absorbent, washable material;
(f) a plurality of ventilation and traction eyelets located in each of said upper portion and said lower portion adapted to be positioned against a lateral portion of the leg;

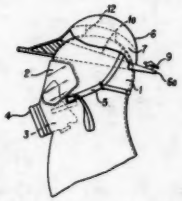
(g) an elastic band located proximate said upper circumference and adapted to be located beneath the knee of said leg;
(h) two bean-shaped pads embedded within the thickness of said stocking, each pad to be located adjacent the Achilles tendon and each pad having a thickness to fill the retro-malleolar cavity on either side of the Achilles tendon to thereby support the Achilles tendon;
(i) a chamfered heel piece to be located at the heel, said heel piece being comprised of a plastic material, distinct from but attached to said fabric to antevert the axis of the leg and to relieve tension on the Achilles tendon;
(j) an ankle support to be located at the osteo-musculotendinous complex of the ankle; and
(k) an elastic transition zone position between said ankle support and said fabric, extending from a position adjacent the middle portion of the foot to the upper two-thirds of the lower leg to prevent constricting the leg adjacent said ankle support.

4,811,728
RESPIRATOR HOOD
Guenter Von Kopp, Berlin, Fed. Rep. of Germany, assignor to Auergesellschaft GmbH, Berlin, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 627,441, Jul. 3, 1984, abandoned. This application Sep. 29, 1986, Ser. No. 913,119
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1983, 3324599
Int. Cl.[4] A62B *7/10*
U.S. Cl. 128—201.25 **5 Claims**

1. In a respirator hood comprising a hood with a crown, said hood being of a non-flammable textile material adapted to substantially enclose the head and neck of a wearer with the crown of the hood fitting over and resting on the head of a wearer, and having a front window adapted to be positioned adjacent the wearer's eyes;
(a) an inside mask positioned within said hood and including

a respirator filter extending through said hood and secured to the hood and fluidically communicating with the interior of said inside mask; and

(b) an adjustable strap means for securing the inside mask and the respirator filter to the wearer; the improvement comprising in combination with the foregoing: (i) an impact-resistant head protector having an open face through



which the hood extends during use and which is adjacent to, conforming to and covering the crown of the respirator hood; (ii) fitting means on the inside surface of said protector for attaching same to the adjacent crown; and (iii) removable cover means secured across the open face of the protector, to enclose the respirator hood and filter therein until needed.

4,811,729

RECOMPRESSION CHAMBER

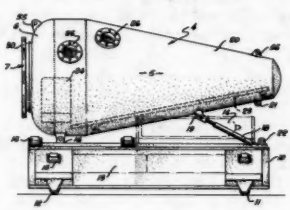
Robert L. Sands, Kempsey, and John Pennefather, Frenchs Forest, both of Australia, assignors to Paracel Holdings Pty. Limited, Kempsey, Australia

Filed May 20, 1987, Ser. No. 52,572

Claims priority, application Australia, May 21, 1986, PH6019

Int. Cl.[4] A61M *16/02*

U.S. Cl. 128—202.12 **7 Claims**



1. A compression chamber for treatment of patients suffering baratrauma or the like, comprising a frusto-conical sheel, an end wall closing the base of said shell, a sealable hatch in said end wall to provide access to said chamber, said means to selectively vary the altitude of the truncated apex of the frusto-conical shell with respect to said end wall, said means to vary the altitude of said truncated apex comprising pivot means attached to said shell adjacent said end wall and fluid-operated ram means coupled to said truncated apex to raise and lower it with respect to said pivot means.

4,811,730

CPR FACE MASK AND METHOD OF USING SAME

Arthur J. J. Milano, Burlington, Conn., assignor to Seitz Corporation, Torrington, Conn.

Filed Jul. 18, 1988, Ser. No. 220,539

Int. Cl.[4] A61M *16/00*

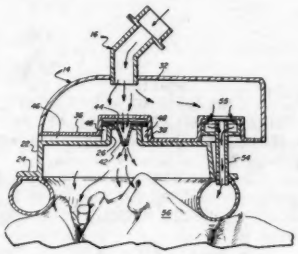
U.S. Cl. 128—203.11 **13 Claims**

1. In a mouth-to-mouth resuscitation device, the combination comprising:

(a) a base member having a top wall and a depending side-wall extending about its periphery to define a plenum chamber within said base member;

(b) an inflatable bladder extending about the periphery of said base member and adapted to form a seal about the nose and mouth of a patient;

(c) a delivery member above said base member having a first conduit communicating with, said plenum chamber, a second conduit communicating with said bladder, and said plenum chamber, and an air feed orifice for introduction of air thereinto;



(d) one-way valve means in said first conduit to permit passage of air from said delivery member into said plenum chamber and to preclude movement of air in the reverse direction; and

(e) pressure responsive valve means in said second conduit permitting passage of air into said bladder to effect inflation thereof, said valve means automatically sealing in response to pressure within said bladder to prevent further flow of air therethrough upon establishment of a predetermined pressure in said bladder.

4,811,731

DEVICES FOR ADMINISTERING MEDICAMENTS TO PATIENTS

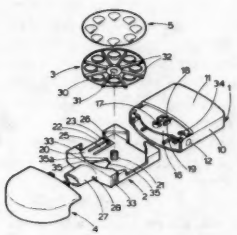
Robert E. Newell, Pinner; Paul K. Rand, Nitchin, and Robert A. Fitzsimmons, Barnard Castle, all of England, assignors to Glaxo Group Limited, London, England

Filed Jul. 29, 1986, Ser. No. 891,536

Claims priority, application United Kingdom, Jul. 30, 1985, 8519141; Oct. 10, 1985, 8525067

Int. Cl.[4] A61M *15/00*

U.S. Cl. 128—203.15 **4 Claims**



1. A device for administering medicaments in solid finely divided form to patients, comprising a housing; a tray mounted in the housing and rectilinearly slidable between first and second positions relative to the housing; a support provided on the tray and adapted to receive a carrier provided with at least one medicament container; plunger means on said housing for penetrating a container received on said carrier when said tray

is in said second position to open the container, air inlet means in said housing through which air can enter the device, and outlet means through which a patient can inhale whereby medicament from an opened container will be entrained in the air flow produced by the patient, air entering the air inlet means and passing out through the outlet means having entrained medicament therein, and means rotatably mounting said support on said tray such that said support may receive a carrier having a plurality of medicament container arranged in a circle.

4,811,732

PROTECTIVE BREATHING APPARATUS HAVING BREATHING AIR CIRCULATION

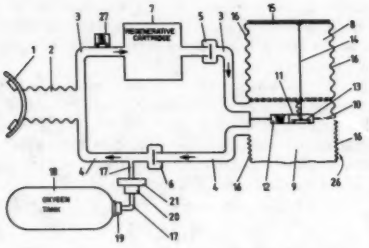
Karl-Heinz Hartung, Northumberland, Great Britain, assignor to Draegerwerk AG, Fed. Rep. of Germany

Continuation of Ser. No. 779,525, Sep. 24, 1985, abandoned. This application Aug. 26, 1987, Ser. No. 90,427

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1985, 3515030

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—204.26 **3 Claims**



1. A protective breathing apparatus for a user inhaling a volume of gas and exhaling a volume of gas, comprising: a user connection line adapted for connection to the user; an inhale line connected to said connection line; a first check valve in said inhale line for permitting passage of gas only toward said connection line through said inhale line; an exhale line connected to said connection; a second check valve in said exhale line for permitting passage of gas only from said connection line through said exhale line; lung controlled oxygen supply means connected to said inhale line for supplying oxygen to said inhale line upon a falling of pressure in said inhale line due to the unsatisfied demand of the user; a storage space unit connected to said inhale line and to said exhale line, said storage space unit including a partition wall dividing said storage space unit into a first storage space portion, which includes the connection to said exhale line and a breathing bag space portion, which includes the connection to said inhale line; said first storage space portion comprising a wall opposite from said partition wall and a first expandable bellows connected between said wall and said partition wall, the volume defined by said first storage space portion being expandable up to a maximum volume comprising at least a plurality of exhalation volumes of the user, said breathing bag space portion comprising a breathing bag sealingly connected to the surface of said partition wall opposite said first storage space portion and a transfer means connected through said partition wall for opening communication between said first storage space portion and said breathing bag space portion only after said maximum volume of said first storage space portion has been reached.

4,811,733

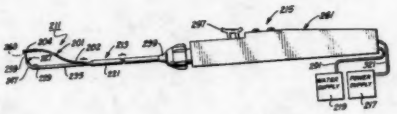
ELECTROSURGICAL DEVICE

Alexander S. Borsanyi, Newport Beach, and Colette R. D. Cozean, Diamond Bar, both of Calif., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 712,371, Mar. 14, 1985, abandoned. This application Dec. 29, 1986, Ser. No. 946,800

Int. Cl.[4] A61B *17/36*

U.S. Cl. 128—303.14 **22 Claims**



1. A device for electrosurgery, comprising:

an elongated probe having a curved distal end portion insertable into an incision, the probe defining an elongated passage extending longitudinally within the probe to a port in the distal end portion;

adjustable electrode means, including an electrode defined by an electrically conductive member disposed coaxially within the passage having a resiliently deformable distal end portion extendible out of the port in a first direction offset angularly from the direction of elongation of the probe, for enabling manual movement of the electrode within the passage so that the distal end portion of the electrode can be projected out of the port a variable distance in the first direction to position the distal end portion of the electrode selectively for electrosurgery purposes between a closed position wherein a terminal end of the electrode is closely adjacent the distal end portion of the probe to an extended position wherein the terminal end is a greater distance from the port; and

shielding means, including a shielding member defined by a resilient, elongated member extending alongside the probe, the shielding member having a first end portion mounted on the probe and a second end portion for shielding the terminal end of the electrode from tissue during surgery.

4,811,734

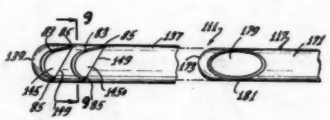
SURGICAL CUTTING INSTRUMENT

Erin McGurk-Burleson, Clemente, Calif.; Elmer Koehler, St. Louis, Mo., and Victor Packham, Santa Ana, Calif., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Aug. 13, 1987, Ser. No. 85,644

Int. Cl.[4] A61B *17/32*

U.S. Cl. 128—305 **19 Claims**



1. A surgical cutting instrument comprising:

an outer tube sized for insertion through an opening in a patient, said outer tube having a peripheral wall and a longitudinal axis;

said outer tube having a plurality of openings arranged generally longitudinally along the outer tube;

each of said openings having first and second cutting edges defining portions of the periphery of such opening, said first cutting edge of each of said openings being substantially straight as viewed in a particular direction perpendicular to the longitudinal axis of the outer tube;

an inner cutting member rotatable within said outer tube;

said inner cutting member having a cutting edge cooperable with said first and second cutting edges of said openings of the outer tube for cutting material from within the patient with a shearing action that progresses along said first and second cutting edges as the inner cutting member rotates; and

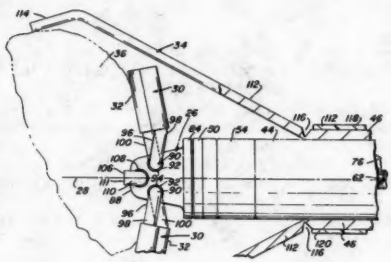
each of said openings including a curved edge which includes said second edge and each of said first edges intersecting the associated curved edge and substantially defining therewith the full periphery of the associated opening.

4,811,735

STONE DESTROYING CATHETER AND METHOD OF USE

John Nash, Downingtown, and Mark Michels, Glen Mills, both of Pa., assignors to Kensey Nash Corporation, Exton, Pa.

Filed Jul. 30, 1987, Ser. No. 79,610
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—305 **33 Claims**



1. Apparatus for disintegrating or otherwise destroying a stone within the body of a living being, said apparatus comprising a small diameter instrument having an elongated portion including a longitudinal axis and comprising a working head, said elongated portion capable of being located at a position within said body wherein said working head is adjacent the stone, said working head being coupled to means for rotating said working head at a high speed about said axis, said working head comprising a first portion, at least one impacting member having an impacting surface thereon, and coupling means movably coupling said impacting member to said first portion for enabling said impacting member to move from a retracted position to an extended position, said impacting surface being located a greater radial distance from the longitudinal axis of the elongated portion of the apparatus when in said extended position than when in said retracted position, said impacting surface being arranged when rotating in said extended position to impact said stone to disintegrate or otherwise destroy it.

4,811,736

SURGICAL DRILL AND BUR FOR USE THEREWITH

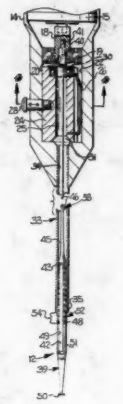
Calvin Griggs, and J. C. Horn, both of Memphis, Tenn., assignors to Treace Medical, Inc., Memphis, Tenn.

Filed Apr. 20, 1987, Ser. No. 40,138
Int. Cl.[4] A61B *17/32*
U.S. Cl. 128—305.1 **7 Claims**

1. A drill bur for use with a surgical drill having a rotatably driven chuck, said drill bur comprising

an elongate shaft composed of first and second shaft components, said first component having one end thereof adapted for rotatable interconnection of the chuck of the surgical drill and an opposite end portion in the form of a cylindrical journal, and a first radial shoulder positioned between said journal and the remainder of said first shaft component, with said first radial shoulder facing toward said journal, and wherein said second shaft component has a coaxial bore in one end thereof which is coaxially and fixedly mounted upon a portion of the axial length of said cylindrical journal, and such that said one end of said second shaft component forms a second radial shoulder which faces said first radial shoulder, and a cutting tip mounted at the other end of said second shaft component, and

a relatively hard, plastic sleeve bearing disposed coaxially upon said journal with said sleeve bearing having opposite



ends which are disposed adjacent respective ones of said radial shoulders, and with said plastic sleeve bearing being freely rotatable with respect to said journal, and with the portion of said second shaft component adjacent said sleeve bearing having a cylindrical outer surface which has an outer diameter which is substantially the same as that of said sleeve bearing.

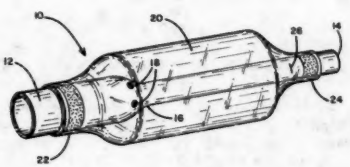
said plastic sleeve bearing being distinctively colored, with the color being correlated to the particular configuration or size of said cutting tip.

4,811,737

SELF-PURGING BALLOON CATHETER

Mark A. Rydell, Golden Valley, Minn., assignor to Schneider-Shiley (USA) Inc., Minneapolis, Minn.

Filed Nov. 16, 1987, Ser. No. 120,658
Int. Cl.[4] A61M *29/02*
U.S. Cl. 128—344 **4 Claims**



1. An intravascular catheter for use in transluminal angioplasty procedures of the type including an elongated, flexible, plastic, tubular catheter body having a proximal end and a distal end, at least one relatively large diameter opening formed through the side wall of said plastic tubular catheter approximate said distal end thereof, an inflatable tubular expander member sealingly affixed at opposed, spaced-apart ends thereof, the end seals being located proximally and distally of said opening, the improvement comprising:

a vent opening extending through the wall of said tubular

catheter at a location slightly proximal of said end seal which is distal of said large diameter opening for venting air from said expander member when a liquid, under pressure, is introduced into said proximal end of said tubular catheter, said vent opening being of a size to preclude liquid flow therethrough and also precluding the re-entry of air into said expander member when said liquid is subsequently aspirated from said expander member.

4,811,738

CARDIAC PACEMAKER CIRCUIT WITH FAST STORED CHARGE REDUCTION

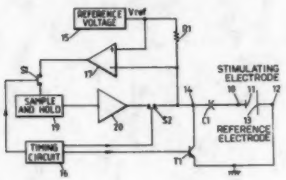
Apollo P. Economides; Stephen Gergely, and Christopher Walton, all of Coventry, England, assignors to Coventry City Council, Coventry, Great Britain

Filed May 21, 1987, Ser. No. 53,135

Claims priority, application United Kingdom, May 23, 1986, 8612659

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—419 PG **7 Claims**



1. A cardiac pacemaker circuit comprising:

a first terminal for connection to a stimulating electrode;

a second terminal for connection to a reference electrode;

timing signal means for generating a timing signal;

stimulating pulse means coupled to said terminals for applying a stimulus pulse across said terminals in response to said timing signal, said stimulus pulse means comprising reference voltage source means for generating a reference voltage and switch means responsive to said timing signal to apply said stimulus pulse from said reference voltage source means to said terminals;

and charge reducing means operable on termination of said stimulus pulse to reduce charge stored between said terminals for enabling monitoring of intrinsic pulses;

and wherein said charge reducing means comprises means for repeatedly sampling the voltage difference between said first terminal and said reference voltage means on termination of said stimulus pulse and reducing said stored charge after each said sample until the voltage across said first and second terminals is reduced to a value substantially equal to zero.

4,811,739

METHOD AND APPARATUS FOR THE DETERMINATION OF SUBSTANCES IN HUMAN FLUIDS

Robert H. Silver, 5913 Hillview Park, Van Nuys, Calif. 91401

Continuation of Ser. No. 414,928, Sep. 3, 1982, abandoned, Continuation of Ser. No. 866,502, Jan. 3, 1975, abandoned. This application Feb. 12, 1988, Ser. No. 158,024

Int. Cl.[4] A61B *3/14*

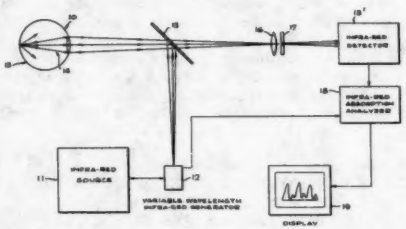
U.S. Cl. 128—664 **16 Claims**

1. An apparatus for determining the presence of substances in the vitreous humor of the eye of a subject wherein the absorption of light passing through the vitreous humor of the eye is analyzed comprising in combination:

(a) means for generating incident light;

(b) optical means for focusing said incident light through the pupil and the vitreous humor of the eye of a subject and onto the retina of the eye; and

(c) means for measuring the intensity of the incident light that is reflected from the retina back through the vitreous humor and pupil of the eye, and for comparing the intensity of the reflected light with the intensity of the incident



light in order to determine the amount of absorption of the incident light passing through the vitreous humor of the eye.

4,811,740

ULTRASONIC DIAGNOSIS APPARATUS CAPABLE OF PROBE EXCHANGE

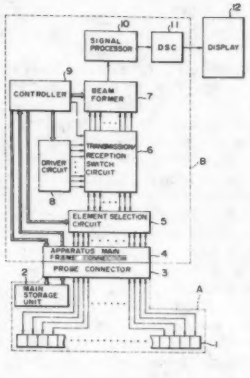
Hiroshi Ikeda; Shinichiro Umemura, both of Hachioji, and Kageyoshi Katakura, Tokyo, all of Japan, assignors to Hitachi Medical Corp., Tokyo, Japan

Filed Dec. 10, 1987, Ser. No. 131,088

Claims priority, application Japan, Dec. 18, 1986, 61-302228

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—660.01 **10 Claims**



1. An ultrasonic diagnosis apparatus capable of probe exchange comprising:

an image forming unit having a first connector;

a probe having a plurality of ultrasonic transducer elements disposed in a predetermined configuration;

means including a second connector associated with the probe for electrically connecting and disconnecting said probe from said image forming unit connector;

storage means physically associated with the probe for storing control information and read-out imaging procedure information unique to said probe;

said image forming unit including a control means for reading information stored in the storage means associated with said probe, said control means being connected through said connectors to control said transducer elements when transmitting signals; and

means responsive to signals received from said transducer

through said connectors for forming an image using the read-out imaging procedure information.

4,811,741

VOLUMETRIC DETERMINATION OF A FLUID

William E. Shell, Los Angeles, and Jackie R. See, Fullerton, both of Calif., assignors to See/Shell Biotechnology, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 706,151, Feb. 27, 1985, Pat. No. 4,616,658. This application Aug. 22, 1986, Ser. No. 899,161

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—691 **19 Claims**

1. A process for making a determination of the flow rate of a moving stream of a liquid by evaluation of a small sample of the liquid, said process comprising:

(a) labeling microspheres with a non-radioactive substance to provide non-radioactively labeled microspheres,

(b) introducing the non-radioactively labeled microspheres into the moving stream of liquid and allowing said microspheres to widely disperse in said moving stream of liquid,

(c) selecting a sample of the liquid which is of known or measurable volume and which may contain only a small portion of the microspheres which are introduced,

(d) determining the number of microspheres present in the selected sample of the stream of liquid, and

(e) calculating the flow rate of of the moving stream of liquid using the determination of the number of microspheres present in the selected sample.

4,811,742

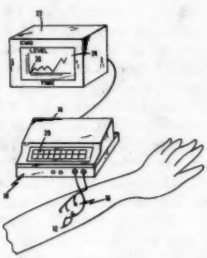
PROPORTIONAL RESPONSE ELECTRICAL MUSCLE STIMULATION

William Hassel, Ft. Lauderdale, and William Mee, Pompano Beach, both of Fla., assignors to Verimed, Inc., Ft. Lauderdale, Fla.

Filed Jun. 11, 1985, Ser. No. 743,635

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—733 **16 Claims**



1. A bioelectrically controlled method of generating electrical muscle stimulation (EMS) signals, comprising the steps of applying to muscles to be stimulated an EMS signal having a particular magnitude; then after a time delay having a duration sufficient to enable EMG artifacts to decay, measuring volitionally produced electromyographic (EMG) signals developed by the muscles to be stimulated; processing the measured signals to obtain processed volitionally produced EMG signals and applying to the muscles an EMS signal having a magnitude that is related to said processed volitionally produced EMG signals.

4,811,743

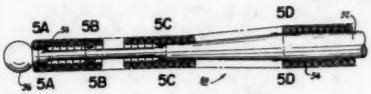
CATHETER GUIDEWIRE

Robert C. Stevens, Williston, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Apr. 21, 1987, Ser. No. 40,606

Int. Cl.[4] A61M *25/00*

U.S. Cl. 128—772 **11 Claims**



1. A guidewire for use in positioning an elongated tubular catheter within a subject comprising:

(a) an elongated flexible core member longer than the tubular catheter and including a ball shaped tip at a distal end;

(b) a tightly coiled wire sheath surrounding a substantial length of said elongated flexible core member and having an outer diameter small enough to be inserted within the tubular catheter and an inner diameter at a distal end less than the ball shaped tip of said core member to prevent movement of the ball shaped tip into the coiled wire sheath, said flexible core member rotatable with respect to the tightly coiled wire sheath; and,

(c) means at a proximal end of said elongated flexible core member for rotating the flexible core member relative to the tightly coiled wire sheath to orient a distal end of said guidewire as the guidewire is moved within the subject.

4,811,744

APPARATUS FOR MEASURING THE DRAW RESISTANCE OF A ROD OF TOBACCO FIBERS

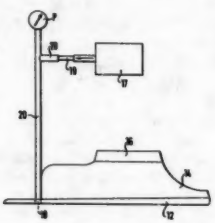
Jörn Ulrich, Bönningstedt; Friedrich Weinhold, Norderstedt, and Meinhard Meyer, Appen-Unterglinde, all of Fed. Rep. of Germany, assignors to B.A.T. Cigarettenfabriken GmbH, Hamburg, Fed. Rep. of Germany

Filed Mar. 21, 1988, Ser. No. 171,343

Claims priority, application European Pat. Off., Apr. 2, 1987, 87104881

Int. Cl.[4] A24C *5/14*

U.S. Cl. 131—84.1 **12 Claims**



1. An apparatus for measuring the draw resistance of a rod of tobacco fibres

(a) comprising a source for a gas stream passing through the rod and

(b) a measuring-value transducer for determining the pressure drop of the gas stream with constant gas volume occurring at the rod wherein

(c) the format finger made from hard metal of a rod-producing machine for the production of smokable articles comprises at a point, at which the diameter of the rod corresponds substantially to the diameter of the finished tobacco rod, at least one opening for subjecting the rod to the gas stream, and

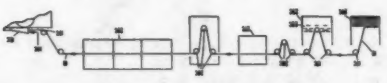
(d) the one or each opening is connected via a critically traversed nozzle in the supply conduit to the gas source.

4,811,745

METHOD AND DEVICE FOR CONTROL OF BY-PRODUCTS FROM CIGARETTE SMOKE

Richmond R. Cohen, Hockessin, Del., and David J. Gibboni, Drexel Hill, Pa., assignors to Hercules Incorporated, Wilmington, Del.

Filed Feb. 4, 1988, Ser. No. 152,213
Int. Cl.[4] A24D 3/06
U.S. Cl. 131—342 **28 Claims**



1. A method for controlling the delivery of by-products found in cigarette smoke, comprising passing cigarette smoke through a filter element of compacted substrate containing an effective amount of at least one active modifier component selected from the group consisting of zinc thiocyanate, sarcosine hydrochloride, zinc chloride, ferrous bromide, lithium bromide and manganese sulfate.

4,811,746

SUBSTITUTE FOR ORAL SMOKELESS TOBACCO AND METHOD OF MAKING THE SAME

Lori J. Davis, 256 SW. Tualatin Loop, West Linn, Oreg. 97068

Filed May 14, 1987, Ser. No. 49,561
Int. Cl.[4] A24B 1/00
U.S. Cl. 131—359 **9 Claims**

1. A method of making a substitute for oral smokeless tobacco comprising:

applying to fragments of tea a binding agent that includes flour, the binding agent being applied at a temperature sufficient to form a moderately agglutinated cohesive mixture thereof; and

moistening the fragments of tea sufficiently to form a compact mass that is dissociable into portions of selectable size by hand-pinching the mass.

4,811,747

ORANGE JUICE HAIR TREATMENT METHOD

Virginia H. Reis, 92 Mather Rd., Stamford, Conn. 06903

Filed Mar. 28, 1983, Ser. No. 479,675
Int. Cl.[4] A45D 7/00
U.S. Cl. 132—203 **5 Claims**

1. A method of setting and holding the set of the hair of a human being without leaving the hair feeling sticky or tacky comprising wetting the hair of said human with water and applying to said hair a hair setting effective amount of the juice of an orange, allowing the hair to partially dry and setting the hair into the desired fashion before the hair dries completely.

4,811,748

METHOD AND APPARATUS FOR CONTINUOUSLY APPLYING SURFACE TREATMENT ONTO AN ARTICLE BEING FED ALONG A PASS LINE

Masatsugu Murao; Kazuhiko Murao, and Tsuyoshi Mochizuki, all of Osaka, Japan, assignors to Naniwa Seitei Kabushiki Kaisha, Osaka, Japan

Filed Apr. 4, 1986, Ser. No. 848,132
Int. Cl.[4] B08B 3/04
U.S. Cl. 134—122 R **5 Claims**

1. An apparatus for applying surface treatment on an article being fed along a pass line comprising in combination:

a tunnel adapted to be located on a portion of the pass line with its longitudinal axis aligned therewith, said tunnel being provided at its one longitudinal end with an inlet through which said article enters the tunnel and at the other longitudinal end with an outlet through which the article exits the tunnel;

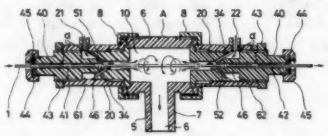
an expansion chamber formed within the tunnel midway between the inlet and the outlet;

a first fluid introducing port for introducing a fluid flow into the tunnel, said first fluid introducing port being located between the inlet and the expansion;, chamber and communicated with the expansion chamber;

a supply vent for supplying a treating agent located between the first fluid introducing port and the inlet;

a first constricted passageway intercommunicating the first fluid introducing port and the expansion chamber and extending along the pass line for receiving therethrough said article;

a first throat formed between the first fluid introducing port and the end of the constricted passageway remote from the expansion chamber so as to produce a first jet of the fluid supplied from the first fluid introducing port and force it to blow into the passageway where it rushes over the article in the same direction as the article for treating the surface thereof, said first jet developing a negative pressure upstream thereof so as to draw in ambient air through the inlet over the article for providing an air seal around the article within the inlet whereby preventing the fluid from escaping outwardly through the inlet;



a second fluid introducing port for introducing a fluid flow into the tunnel, said second fluid introduction port being located between the outlet and the expansion chamber and communicated with the expansion chamber;

a second constricted passage way intercommunicating the second fluid introducing port and the expansion chamber and extending along the pass line for receiving therethrough said article;

a second throat formed between the second fluid introducing port and the end of the constricted passageway remote from the expansion chamber so as to produce a second jet of the fluid supplied from the second fluid introducing port and force it to blow into the passageway where it is blasted over the article in the opposite direction to the article passing in the passageway for treating the surface thereof, said second jet developing a negative pressure upstream thereof so as to draw in ambient air through the outlet over the article for providing an air seal around the article within the outlet whereby preventing the fluid from escaping outwardly through the outlet;

a discharge port on the side of the expansion chamber for recovering the first and second fluid flows therefrom;

said first and second throats being inclined with respect to a common axis of the first and second passageways at an angle of 15 to 60 degrees; and

a spiral groove being formed within the first and second throats.

4,811,749

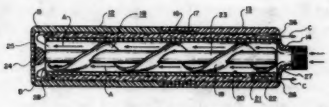
PAINT ROLLER CLEANING DEVICE

Allen L. Dixon, 58 N. 300 West, Smithfield, Cache County, Utah 84335

Filed Sep. 14, 1987, Ser. No. 95,764
Int. Cl.[4] B08B 3/04
U.S. Cl. 134—184 **12 Claims**

2. A paint roller cleaning device comprising a receptacle

constructed to releasably receive a paint roller and having a container and a cap, each of said container and cap having threaded connections, said container and cap being releasably secured together at said connections, said cap having a liquid inlet port constructed for connection to a pressurized liquid



source, and one of said container and cap having at least one liquid outlet port, and wherein said container has an inner base surface, said container including a transverse, elongate spacer head at said base surface for engaging and thereby spacing an end of said paint roller from said base surface for doubled-back liquid-flow about said end.

4,811,750

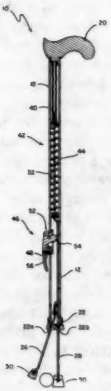
CANE WITH EXTENSIBLE FINGERS

John M. McAllister, 2525 Wake Dr., Raleigh, N.C. 27608

Filed Jun. 14, 1988, Ser. No. 206,282

Int. Cl.[4] A45B *3/00*

U.S. Cl. 135—66 **12 Claims**



1. A cane with extensible fingers for retrieving and picking up objects comprising

(a) a cane having a hollow body and an opening at its lower end;

(b) a finger assembly mounted within the lower portion of the cane and moveable between a retracted closed position and an extended open position, the finger assembly including an elongated actuating rod extending within the cane;

(c) biasing means for biasing the finger assembly toward the extended open position;

(d) locking means for engaging the finger assembly and locking the same in any position between the extended open position and the retracted closed position; the locking means including a spring loaded cam surface for engaging the elongated actuating rod and stationing the same in a locked position so as to lock the finger assembly in a selected position wherein when the locking means is released the finger assembly is outwardly extended by the biasing means and wherein the finger assembly is closed by urging the fingers into the open end of the cane and against the biasing means, and wherein the fingers can be locked in any position while being retracted by engaging the elongated rod with the locking means.

4,811,751

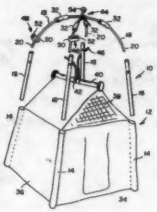
COLLAPSIBLE AND EXPANDABLE TENT

William J. Maloney, II, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Continuation of Ser. No. 920,697, Oct. 17, 1986, abandoned. This application Aug. 12, 1988, Ser. No. 232,522

Int. Cl.[4] E04H *15/44, 15/04, 15/02;* **A63H** *3/52*

U.S. Cl. 135—106 **12 Claims**



1. A collapsible and expandable tent for children comprising:

a tent body of fabric or canvas having four corners;

a flexible bent rod having one end portion secured to a first corner of the tent body and its opposite end portion secured to a second corner of the tent body diagonally across from the first corner;

a second flexible bent rod having one end portion secured to a third corner of the tent body, and its opposite end portion secured to a fourth corner of the tent body diagonally across from the third corner whereby the first and second rods are arranged in criss-crossed relation; and

releasable latch means on said rods, each means engageable with the other rod for releasably holding the first and second rods closely adjacent to each other along their length with two sides of the tent body collapsed when the tent body is in a collapsed condition and with the first and second rods in a more tensioned condition, the first and second rods automatically moving to a less tensioned condition and thereby automatically fully expanding the tent body when the latch means is released.

4,811,752

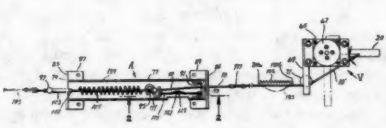
AUXILIARY REMOTE VALVE ACTUATOR

Jerry L. Lyons, St. Louis County, and Keith Tayon, St. Louis, both of Mo., assignors to Essex Industries, Inc., St. Louis, Mo.

Filed Nov. 16, 1987, Ser. No. 121,452

Int. Cl.[4] F16K *17/38*

U.S. Cl. 137—77 **8 Claims**



1. For use with a valve having a valve actuating means for actuating the valve by externally-effected movement of the actuating means, an auxiliary remote actuator for automatically activating means, comprising a cable having an inner end for connection to the valve actuating means, for actuation of the valve by pulling of the cable, a housing for receiving the other, outer end of the cable, the housing forming a longitudinally elongated barrel, an actuating spring within the housing,

the spring being of coiled tension type extending longitudinally within the barrel and having inner and outer ends, the outer spring end being secured within the barrel, a releasable link within the housing for maintaining the spring in a tensioned condition and operative for releasing the spring in response to fire or other exigency, the spring inner end being connected to the releasable link for maintaining the spring in elongated, tensioned condition within the barrel, the outer end of the cable including means for permitting external actuation of the valve by pulling of the cable, means for transferring force from the spring for pulling the cable, the cable extending centrally through the barrel along the length of the barrel from an inner end receiving the cable and through a central space of the spring extending along the length of the cable within the barrel, the means for transferring force from the spring including an engagement member affixed to the inner end of the spring for applying force therefrom to the engagement means upon releasing of the releasable link, and means for mounting of the housing at a location remote from the valve with the cable extending between the enclosure and the valve actuating means.

4,811,753

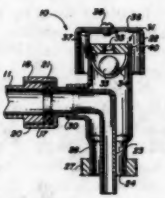
RECREATIONAL VEHICLE DRAIN VENT

Paul P. Bethune, P.O. Box 9, Minneola, Fla. 32755

Filed Dec. 17, 1987, Ser. No. 135,365

Int. Cl.[4] F16K *24/00*

U.S. Cl. 137—217 **8 Claims**



1. A drain vent for recreational vehicles comprising:

a drain vent;

means for coupling said drain vent to a drain line of a vehicle;

means for coupling a drain hose to said drain vent;

said drain vent having an outer housing and an inner drain pipe located in said outer housing and being connected to said means for coupling said drain vent to said drain line of said vehicle whereby said drain line passes directly through said drain vent;

said outer housing forming an annular passageway around said inner drain pipe for the passage of air;

said inner drain pipe protrudes into a narrowed passageway formed by said outer housing to form a venturi with said outer housing at the opening of the passageway and inner drain pipe to said drain hose whereby air is aspirated into the drain vent;

said outer housing having an opening to atmosphere therefrom and having a cap covering said housing opening;

a bracket mounted to said outer housing adjacent the opening therein for mounting said cap; and

a check valve located in said outer housing passageway to allow the passage of air in one direction while blocking the passage of water in the opposite direction; whereby outside vent air may pass into said drain vent to vent said drain line.

4,811,754

RINSE WATER VALVE FOR VACUUM TOILET SYSTEM

Raymond L. Wilhelm, Orange, Calif., assignor to Oy Wärtsilä Ab, Helsinki, Finland

Filed Mar. 6, 1987, Ser. No. 22,882

Int. Cl.[4] F16K *31/02, 31/22, 33/00*

U.S. Cl. 137—218 **7 Claims**

1. A liquid-flow control valve assembly for controlling flow of a selected liquid, comprising

a valve housing having wall means bounding a control chamber, said wall means including a first wall portion formed with an inlet port for entry of fluid into the control chamber and a second wall portion formed with a control port for egress of fluid from the control chamber, the control port being of reduced cross-section area relative to the control chamber, and the valve housing also defining a discharge chamber on the opposite side of the second wall portion from the control chamber,

a valve closure member which is less dense than said selected liquid and is disposed in the control chamber so that when the control chamber contains said selected liquid and the control port is above the valve closure member, the valve closure member is urged by its buoyancy towards the control port so as to obstruct the control port,

an elongate actuator member which extends through the control post and engages the valve closure member for displacing the valve closure member away from the control port so as to allow fluid to flow through the control port, the actuator member having a tubular portion which defines an interior space and being formed with at least one aperture providing communication between the discharge chamber and said interior space,

a solenoid which is disposed on the opposite side of the second wall portion from the control chamber and defines an elongate guide passage,

a generally cylindrical armature which is formed with a through passage in open communication with the interior space of the tubular portion of the actuator member and is fitted in the guide passage for movement therein longitudinally of the guide passage, and

a vacuum breaker valve mounted on the solenoid and comprising a vacuum breaker valve housing defining an inlet port which is in open communication with the through passage of the armature, an outlet port, and a passage which extends from the inlet port of the vacuum breaker valve housing towards the outlet port thereof, and the vacuum breaker valve also comprising pressure-responsive means for controlling flow of fluid through the passage defined by the vacuum breaker valve housing, such that when the pressure of the fluid at the inlet port of the vacuum breaker valve housing exceeds that at the outlet port thereof by a predetermined amount, fluid is able to flow through the passage to the outlet port of the vacuum breaker valve housing, whereas when the pressure of fluid at the inlet port of the vacuum breaker valve housing falls, the outlet port of the vacuum breaker valve housing is isolated from the inlet port thereof.

4,811,755

PROCESS FOR CONTROLLING THE FLOW OF A GAS IN A VALVE AND FLOW GENERATOR EMPLOYING SAID PROCESS

Guy Bourdon, Le Chesnay; Dominique Lampin, Chatillon, and Daniel Leclerc, Boulogne, all of France, assignors to L'Air Liquide, Paris, France

Filed Dec. 11, 1987, Ser. No. 131,578

Claims priority, application France, Dec. 19, 1986, 86 17806

Int. Cl.[4] G05D *7/06*

U.S. Cl. 137—486 **8 Claims**

1. A gas flow generator for regulating the flow of gas from a gas supply means, the generator comprising a gas supply pipe for connection to the gas supply means, a body provided with gas outlet means, a gas outlet pipe connected to the gas outlet

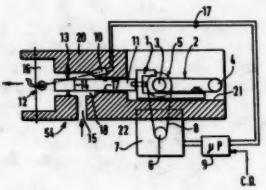
means, and a closure member movable in the body and being disposed in the gas supply pipe, a seat for cooperation with the closure member to vary the flow of gas through the generator and placed between the gas supply pipe and the gas outlet pipe, closure member control means for displacing the closure member, the displacement of the closure member under the action of said control means permitting a variation of the flow of gas from the gas supply pipe to the gas outlet pipe,

said generator comprising a sensor for providing information on the position of the closure member relative to the seat,

said closure member control means comprising

a. a step-by-step motor having an output shaft,

b. a microprocessor which is controllingly connected to the motor and to said sensor and which includes memory means storing



i. data relating to the geometry of said valve,

ii. data relating to the pressure of the gas on at least one side of the closure member and

iii. data relating to the type of gas flow employed,

c. means for calculating a number of steps to displace said closure member and thereby vary said flow of gas based on the position information delivered by said sensor and on said data in said memory means,

d. means for generating a control signal corresponding to the calculated number of displacement steps so as to displace said closure member in an amount corresponding to said calculated number of displacement steps and

e. means for driving the closure member cooperative with the shaft of the motor so as to displace said closure member in a stepwise manner.

4,811,756

SAFETY VALVE

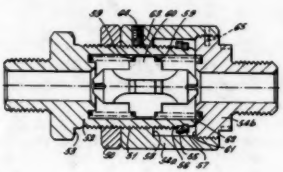
Raymond J. Hall, Great Kingshill, United Kingdom, assignor to Compair Power Tools Limited, Bucks, England

Filed Nov. 20, 1987, Ser. No. 123,349

Claims priority, application United Kingdom, Apr. 10, 1987, 8708655

Int. Cl.[4] F16K *17/26*

U.S. Cl. 137—498 **14 Claims**



1. In a safety valve for connection into a fluid pressure delivery line, said safety valve comprising a housing which includes two openings, a first of said two openings constituting an inlet and a second of said two openings constituting an outlet, a valve member within the housing operable substantially to close either of said first and second openings, means resiliently biasing the valve member to a position in which a flow path through the valve from one of said first and second openings to the other of said first and second openings is open, and means defining a restricted flow path therethrough, said valve member being movable from its said resiliently biased position to a position substantially closing off one of said first and second openings when fluid flow through the housing towards said one opening exceeds a predetermined rate, while the restricted flow path-defining means permits a bleed through said one opening, the improvement wherein said safety valve includes means for adjusting said housing to result in said movement of the valve member occurring at different flow rates, and locking means for releasably locking the housing in an adjusted position.

4,811,757

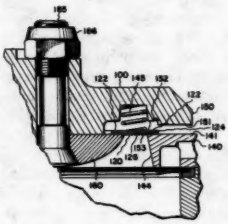
DISCHARGE VALVE FOR COMPRESSOR

George W. Brandt, Tyler, Tex., assignor to American Standard Inc., New York, N.Y.

Filed Feb. 1, 1988, Ser. No. 151,035

Int. Cl.[4] F16K *15/08*

U.S. Cl. 137—514.5 **12 Claims**



1. A discharge valve assembly for a gas compressor comprised of:

a valve seat member defining a discharge aperture, said valve seat member further having a valve seating surface;

a generally planar annular valve member having a thickness t and an edge having a diameter e, said valve member selectively engaging said valve seating surface in a closed position so as to sealingly cover said discharge aperture, and disengaging said valve seating surface in an open position so as to permit gaseous communication through said discharge aperture;

a valve cage including annular lip portion having a height substantially equal to the thickness t of said valve member, said annular lip portion further defined by a diameter p where said diameter e of said valve member edge is slightly smaller than the diameter p of said lip portion, said annular lip portion accepting said valve member immediately adjacent said valve member in the open position so as to substantially reduce oscillation of said valve member and further so as to induce a venturi effect upon said valve member by gas communicating through said discharge aperture when said valve member is in the open position, whereby the gas communicating through said discharge aperture tends to maintain said valve member in the open position; and

means for biasing said valve member to the closed position.

4,811,758

PRESSURIZED CHECK VALVE

Britton F. Piper, Edmond, Okla., assignor to Torus Equipment, Inc., Oklahoma City, Okla.

Filed Jun. 14, 1988, Ser. No. 206,609

Int. Cl.[4] F16K *15/14*

U.S. Cl. 137—844 **15 Claims**

9. A pressurized fluid check valve assembly comprising:

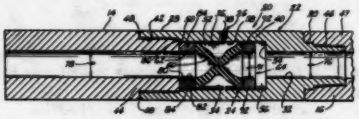
a tubular body member having a bore extensive there-

through between first and second end portions thereof, the bore having an enlarged medial portion forming a valve chamber and an access bore extending through the wall of the body member communicating with the valve chamber;

flow restricting means supported by the body member in the valve chamber for selectively closing the valve chamber to fluid flow in a pressurized mode, the flow restricting means comprising:

an elastomeric sleeve;

sleeve retention means for securing one end of the elastomeric sleeve at an upstream end of the valve chamber; and



an annular piston supported by the elastomeric sleeve at its downstream end for slideably supporting same in the valve chamber and engaging the internal wall of the valve chamber, an annular pressure cavity formed about the elastomeric sleeve and between the sleeve retention means, the annular piston and the internal wall of the valve chamber, the access bore communicating with the annular pressure cavity; and

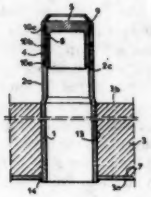
loading valve means supported in the access bore for permitting the injection of a selected pressurizing gas to the pressure cavity and retaining a pressurized mode thereof so that the elastomeric sleeve is caused to restrict and thereby close the valve chamber to fluid flow unless such fluid is under pressure sufficient to overcome the pressurizing gas pressure.

4,811,759

DEVICE FOR THE FLUIDTIGHT CLOSURE OF AN APERTURE EXTENDING THROUGH A WALL

Jean-Paul Billoué, Chappet, France, assignor to Framatome, Courbevoie, France

Filed Oct. 5, 1987, Ser. No. 104,021
Claims priority, application France, Oct. 6, 1986, 86 13872
Int. Cl.[4] F16L *55/10*
U.S. Cl. 138—89 **5 Claims**



1. Device for the fluid-tight closure of an aperture extending through a partition wall separating two fluids, which device consists of a tubular sleeve closed at one end by a stopper of tubular shape closed by an end piece, wherein the inside bore (2) of the sleeve (1) comprises, in succession, in the axial direction, a first part (2*a*) whose diameter is smaller than the outside diameter of the stopper, and a second part (2*b*) receiving the stopper and having a diameter corresponding substantially to that of the stopper (5), an annular shoulder (2*c*) separating the two parts (2*a*, 2*b*) of the bore, and wherein

(a) the sleeve (1) has an aperture (4) passing through its side wall and leading into the second part (2*b*) of the bore (2);

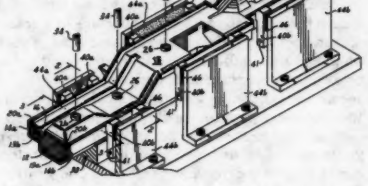
(b) the stopper (5) also has an aperture (8) passing through its side wall (5*a*) and so disposed that, when the stopper (5) is placed in position in the sleeve (1) and held in place by swaging (9) the sleeve (1), said aperture (8) in said stopper will be situated nearer the closed end (5*b*) than the aperture (4) in the sleeve (1), and that three continuous sealing and fastening welds (10*a*, 10*b*, 10*c*) of annular shape, connecting the outer surface of the stopper (5) and the inner surface of the sleeve (1) over their entire periphery and being disposed, in the case of two of them, one on each side of the set of two apertures (4, 8) in the stopper (5) and in the sleeve (1), and, in the case of the third, between the two apertures (4, 8), are made prior to placement of the closure device in the aperture (13) in the partition wall (3).

4,811,760

MULTIPLE CONDUCTOR FLUID HANDLING DUCT FOR AN AUTOMOTIVE VEHICLE

Larry J. Van Kirk, Saline, and Ronald L. Waterloo, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 925,040, Oct. 30, 1986. This application Jan. 6, 1988, Ser. No. 141,231
Int. Cl.[4] F16L *11/12, 55/00*
U.S. Cl. 138—115 **5 Claims**



1. A friction welded fluid handling duct for an automotive vehicle comprising:

two or more primary segments, with each having a longitudinal axis, with said segments lying in generally parallel, offset planes with each of said segments comprising a channel section having a base and upstanding wall elements;

one or more connector segments extending between said primary segments with each of said connector segments having a base and upstanding wall elements; and

a unitary cap which is friction welded to said wall elements.

4,811,761

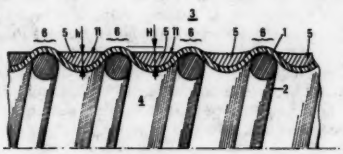
FLEXIBLE TUBE FOR CARRYING HEATING OR REFRIGERANT FLUIDS

Michel Huvey, Bougival, France, assignor to Institit Francais du Petrole, Rueil-Malmaison, France

Continuation-in-part of Ser. No. 663,367, Oct. 22, 1984. This application Sep. 5, 1986, Ser. No. 904,154
Int. Cl.[4] F16L *11/04*
U.S. Cl. 138—122 **25 Claims**

1. A flexible tube comprising an inner sheath having a corrugated outer surface wherein a path of intersection of the corrugated outer surface with a plane passing through the center axis of the flexible tube corresponds to a curve having undulations defining a succession of hollow portions and rounded zones interconnecting the adjacent hollow portions, the hollow portions being located in a portion of the inner sheath near

the center axis of the tube, said rounded zones being located in a portion of the sheath remote from the center axis of the flexible tube, said rounded zones having at each point an osculating circle having a center disposed on a same side of said inner sheath and a non-infinite radius of curvature, and a curvature of the rounded zones is oriented toward the center axis



of the flexible tube, at least one laterally rigid outer reinforcing means is disposed in said hollow portions, said at least one reinforcing means having a height such that a portion thereof contacts the hollow portions at least to the rounded zones, and wherein said at least one reinforcing means is constructed so as to perfectly match a shape of the undulations and is non-adhering to said inner sheath.

4,811,762

WEFT YARN STORE FOR A LOOM

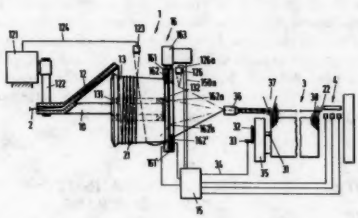
Robert Bucher, Frick, and Paul Lincke, Kollbrunn, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jul. 15, 1987, Ser. No. 73,466

Claims priority, application Switzerland, Jul. 15, 1986, 2825/86

Int. Cl.[4] D03D *47/36*

U.S. Cl. 139—452 **8 Claims**



1. A weft yarn store for a loom, the store comprising: a drum for taking up a supply of weft yarn; at least one winder for winding weft yarn from a package outside the store onto the drum; and means for retaining the weft yarn at the run-off end of the drum upon the termination of picking, said means including a retaining element which is adjustable in the peripheral direction of the drum by a controllable drive during operation, so that the length of the yarn running off the drum can be metered accurately, said retaining element including a finger actuatable magnetically in the radial direction and received in a ring which extends around the drum at its yarn run-off end, said ring, retaining element and the associated drive being provided in dual form.

4,811,763

ARRANGEMENT FOR FILLING FUEL TANKS OF MOTOR VEHICLES, ESPECIALLY OF MOTORCYCLES

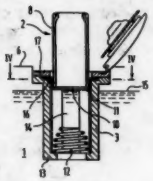
Peter Kupske, Bieberach, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 891,846, Aug. 1, 1986, abandoned. This application Aug. 26, 1987, Ser. No. 89,946

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1985, 3527773

Int. Cl.[4] B65B *3/00*

U.S. Cl. 141—44 **5 Claims**



1. An arrangment for filling fuel tanks of motor vehicles, with venting of the tank to atmosphere upon opening of a filler cap to relieve excess pressure built up in the tank and with subsequent sealing of the venting to atmosphere to prevent escape of fuel vapors during fuel filling operations, comprising cylinder means secured at tank walls and surrounding a tank filling opening in said tank walls; said cylinder means projecting into the tank for containing a short pipe member arranged therein; said short pipe member being displaceably arranged in said cylinder means to be retracted and extended; said short pipe member being stoppable when extended at a position projecting out of the tank walls and having a length that corresponds essentially to an insertion depth of a discharge pipe of a filling nozzle equipped with a suction means for the fuel vapor-air-mixture; cover means for closing the filling opening and said short pipe member when retracted; seal means for preventing the discharge into the atmosphere of fuel vapor-air-mixture in the tank during the filling of the tank; the cylinder means being provided with at least one aperture means connected to the area above the filling level in the tank and with the atmosphere around a space between the cylinder means and said short pipe member when said short pipe member is retracted; said seal means closing the aperture means when said short pipe member is extended; a closure lid is provided at an end of the short pipe member, which closure lid is spring-loaded to a closing position and opens in a direction away from said tank filling opening; a bayonet connection means for stopping the short pipe member, said bayonet connection means including an annular groove defined by two lateral surfaces and one vertical surface, which annular groove is arranged at the upper end of the cylinder means; and wherein the short pipe member has an annular collar and the bayonet connection means includes claw means on said annular collar for stopping the short pipe member and wherein the annular collar forms the seal means by abutment at one of the lateral surfaces of the annular groove.

4,811,764

MEDICATION DISPENSER STATION

John T. McLaughlin, 1839 Risa Pl., Glendale, Calif. 91208

Filed Oct. 19, 1987, Ser. No. 109,591

Int. Cl.[4] B65D *83/04*; A47B *67/02*

U.S. Cl. 141—98 **17 Claims**

1. A medication dispenser station, comprising:

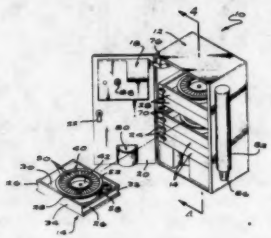
a plurality of cassettes each for receiving a respective one of a plurality of different medications in individual doses, each of said cassettes including a discharge opening for discharge passage of the medication therefrom, each of said cassettes comprising a tray having a tray floor with

said discharge opening formed therein, and a carousel rotatably supported upon said tray floor, said carousel defining a generally vertically open plurality of compartments arranged in an annular array for rotation over said discharge opening, each of said compartments being adapted to receive an individual dose of medication;

a cabinet;

means for mounting said cassettes within said cabinet in a generally vertical stack, with said discharge openings of said plurality of cassettes being generally vertically aligned to define a generally vertically oriented discharge chute;

driving means for individually driving each of said cassettes to displace a dose of the medication received therein into alignment with said discharge opening whereby the displaced dose of medication falls through said chute when



said cassettes are mounted within said cabinet, said driving means comprising a drive motor carried by each of said cassettes, and means for coupling said drive motor for each cassette to a source of power when said cassette is installed into the cabinet;

means for locking said cassettes within said cabinet to prevent direct access thereto from the cabinet exterior;

control means accessible from the exterior of said cabinet to control operation of said driving means for causing any selected one of said cassettes to displace a dose of the medication therein into alignment with said discharge opening; and

receiver means accessible from the exterior of said cabinet and positioned at a lower end of said chute whereby medication falling through said chute falls into said receiver means for access from the cabinet exterior.

4,811,765

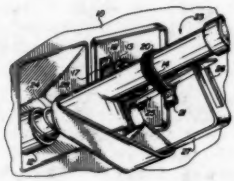
FUEL PUMP LEVER HOLDING MEMBER

Salvador N. Giha, 77 N. Court Rd., Tivertoa, R.I. 02878

Filed Mar. 28, 1988, Ser. No. 174,139

Int. Cl.[4] B65B *3/04*; B65D *51/24*

U.S. Cl. 141—392 **4 Claims**



1. A fuel pump nozzle handle lever holding member for holding a fuel pump nozzle handle while filling a vehicle fuel tank through the vehicle fuel tank filling tube comprising:

in combination a vehicle having a fuel tank and filling tube and a strip of flexible material having hook and loop material attached to each side thereof and sized to extend around a fuel pump nozzle handle and lever when the lever is actuated while filling said vehicle fuel tank, said strip of flexible material having hook material on one side thereof and loop material on the other side thereof whereby one side can be hooked to the other to hold a fuel pump lever in an actuated position;

means to store said strip of flexible material adjacent said vehicle fuel tank filling tube, whereby the fuel pump nozzle handle lever holding member is kept handy for filling the vehicle with fuel; and said means to store said strip of flexible material adjacent said vehicle fuel tank filling tube having a piece of hook and loop material attached to the vehicle adjacent the fuel tank filling tube to hold said strip of flexible material during storage between fuel tank fills.

4,811,766

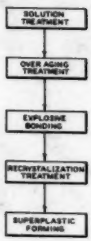
EXPLOSIVELY BONDED EXPANDED STRUCTURE

Shankar M. Sastry, Chesterfield, and Richard J. Lederich, Des Peres, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Oct. 8, 1987, Ser. No. 107,404

Int. Cl.[4] C22F *1/04*

U.S. Cl. 148—11.5 A **12 Claims**



1. A method of superplastically forming aluminum composite structures comprising subjecting aluminum stock elements to a heat treatment, explosively bonding a plurality of the stock elements into a unitary structure, subjecting the unitary structure to a second heat treatment, the combination of heat treatments being effective to provide a superplastically formable fine microstructure in the bonded unitary structure and superplastically forming the bonded unitary structure into a complex shape, the explosive bonding being effective to produce a strong, peel resistant bond, between the stock elements, the bond being effective to maintain the unitary condition of the bonded structure during superplastic forming.

4,811,767

PROTECTIVE COVER FOR SWIMMING POOL PUMP AND FILTER ASSEMBLIES

Emerich Kessler, 28 Lakeview Dr., West Orange, N.J. 07052

Filed Nov. 17, 1987, Ser. No. 121,677

Int. Cl.[4] B65D *65/04*

U.S. Cl. 150—154 **7 Claims**

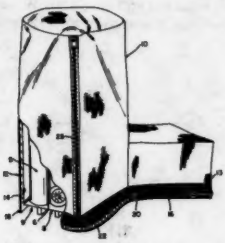
1. An easily installable and removable, substantially weather proof, protective cover adapted to protect a swimming pool pump and filter assembly, comprising:

a plurality of separate pieces which when assembled and joined to each other form a unitary body which conforms substantially to the shape of said swimming pool pump and filter assembly, said cover including a weather proof outer layer sized to fit snugly around and substantially enclose the pump and filter assembly;

a mesh border affixed to the bottom edge of said weather proof outer layer; and

means located in said mesh border for securing the cover

around the pump and filter assembly, whereby said swimming pool pump and filter assembly is protected from



adverse weather conditions while at the same time permitting the escape of moisture and heat from under said cover.

4,811,768

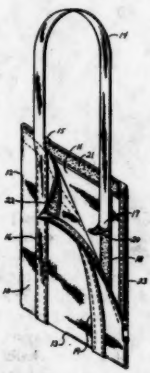
UNDERARM SECURITY POUCH FOR CARRYING CASH RECEIPTS CONTAINER

Joseph P. Williams, 8085 Busey Rd., Pickerington, Ohio 43147

Filed Apr. 8, 1988, Ser. No. 183,561

Int. Cl.[4] A45C *1/10, 13/10, 13/22, 13/36*

U.S. Cl. 150—102 **4 Claims**



1. A security pouch of a size adapted to hold a cash receipts container in a vertical position and adapted to be worn by an individual and suspended from the shoulder of said individual and positioned adjacent the side of the individual's chest and under the individual's arm and comprising:

a flat, oblong container comprising two oppositely disposed substantially flat panels, said flat panels each having two substantially parallel longer sides connected by two substantially shorter sides, means for permanently joining one pair of said shorter sides and one pair of said longer sides together throughout their length, means for detachably securing the remaining pair of said shorter sides and the remaining pair of said longer sides of each panel to each other at the edges thereof,

a strap,

means connecting one end of said strap to one end of said pair of shorter sides which are detachably secured to each other at the edges thereof, the other end of said strap being detachably connected by means of hook- and loop-type fasteners to the interior of said pouch adjacent to the pair of longer sides which are detachably secured to each other for a length sufficient to permit adjustment of the useful length of said strap, and to provide support of said security pouch in normal usage, but which will permit detachment of said other end of said strap from said pouch when force is applied to the exterior of said pouch.

4,811,769

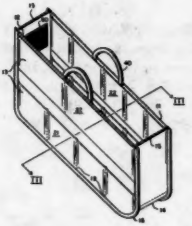
PURSE INSERT

Robert R. Phares, 3355 Claire La. #1415, Jacksonville, Fla. 32217

Filed Jan. 25, 1988, Ser. No. 148,368

Int. Cl.[4] A45C *13/02*

U.S. Cl. 150—113 **3 Claims**



1. A purse insert comprising:

A. two substantially parallel, principal walls formed from a relatively stiff, yet flexible, plastic sheet, substantially rectangular in shape, covered on both sides by a flexible, non-elastic fabric material;

B. a strip of elastic material connecting the two principal walls along their bottom and vertical edges, thereby defining a central area open only at the top, where the principal walls can be separated to accommodate large items by stretching the elastic connecting material; and

C. a plurality of pockets formed from a material having elastic properties, where the pockets are formed by attaching one or more horizontal strips of double-layered elastic material to the flexible, non-elastic fabric material of the principal walls and further vertically stitching the horizontal elastic material to form individual pockets open only at the top.

4,811,770

STRUCTURAL ELEMENT FOR A BUILDING

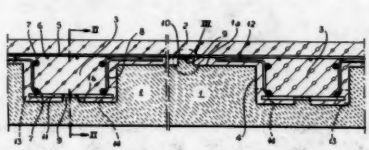
Albert B. Rapp, Pater-Kilian-Str 3, D-5983 Balve 1, Fed. Rep. of Germany

Filed Mar. 25, 1987, Ser. No. 30,729

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1986, 3610030

Int. Cl.[4] E04C *1/00*

U.S. Cl. 52—309.12 **6 Claims**



1. In a structural element for a building comprising an insulating panel and a concrete rib plate, said concrete rib plate having a plurality of base members and rib members being cast on said insulating panel instead of a form, each of said rib members being engaged in corresponding recesses of said

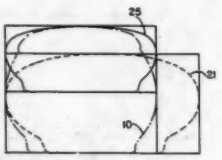
insulating panel, said concrete rib plate having a planar reinforcement in the form of at least one steel mat and said rib members having a corresponding plurality of rib reinforcing elements, the improvement wherein said insulating panel is provided with a plurality of spacing retainers some of which project into said rib members and some into said base members on which said steel mat and said rib reinforcing elements rest and which position and orient said steel mat and said rib reinforcing elements, said steel mat having a plurality of longitudinal rods and transverse rods with a predetermined grid size, said spacing retainers for said rods of said steel mat having a plurality of positioning receptacles according to said grid size, and said receptacles being sunken areas cut into said retainers sufficiently large for holding said rods against movement.

4,811,771

AERODYNAMIC PROFILE TIRE

Paul S. Shoemaker, Stow, and John D. Kelley, Jr., Akron, both of Ohio, assignors to General Tire, Inc., Akron, Ohio

Filed Jan. 7, 1988, Ser. No. 141,456
Int. Cl.[4] B60C *03/04*
U.S. Cl. 152—454 **6 Claims**



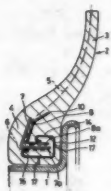
1. An inflatable tire having a low aspect ratio in the range of from 40 to 45, a bead heel diameter (D4) in the range of from 18 to 20 inches, and a ratio of bead heel diameter (D4) to bead heel spacing (W4) in the range of from 2.5 to 3.5.

4,811,772

PNEUMATIC TIRE HAVING MULTI-PART ANNULAR BEAD CORE

Jonny Janus, Kreuzstrasse 53, D-4000 Düsseldorf 1, Fed. Rep. of Germany

PCT No. PCT/DE85/00437, § 371 Date Jul. 2, 1987, § 102(e) Date Jul. 2, 1987, PCT Pub. No. WO87/02627, PCT Pub. Date May 7, 1987
PCT Filed Nov. 5, 1985, Ser. No. 82,124
Int. Cl.[4] B60C *15/04*
U.S. Cl. 152—540 **10 Claims**



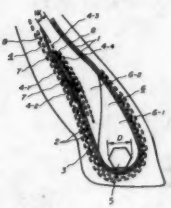
1. A pneumatic tire for a vehicle, said tire having a toroidally bowed body extending about an axis, spaced sidewalls extending radially inward to beads disposed about an inner diameter of said tire, said spaced sidewalls including carcass plies extending said beads, each of said beads including a multi-part annular core comprising a plurality of profiled rings, each of said rings comprising a strip material having an L-shape or U-shape cross-section including substantially flat limb members, said core also including mechanically interlocking means to lock said rings together with portions of said limb members on separate rings disposed in adjacent and substantially parallel relationship, said carcass plies having opposed ends extending between said adjacent and substantially parallel portions of said limb members for connection to said cores.

4,811,773

HEAVY DUTY PNEUMATIC RADIAL TIRES

Kazuyuki Endo, Higashimurayama; Motoaki Taniguchi, Higashiyamato; Shigeki Yamada, Tokyo; Masanobu Takahashi, Iruma, and Kenshiro Kato, Kodaira, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jun. 17, 1987, Ser. No. 63,049
Claims priority, application Japan, Jun. 19, 1986, 61-141354
The portion of the term of this patent subsequent to Oct. 20, 2004, has been disclaimed.
Int. Cl.[4] B60C *15/06*
U.S. Cl. 152—543 **6 Claims**

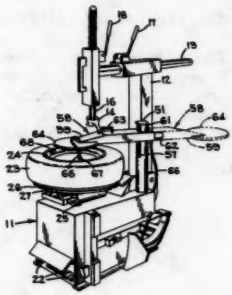


1. A heavy duty pneumatic radial tire comprising; a toroidal carcass composed of at least one cord ply containing aromatic polyamide fiber cords arranged in parallel with each other in a direction substantially perpendicular to the equatorial plane of the tire and wound around a bead core from the inside of the tire toward the outside thereof to form a turnup portion, a belt superimposed about a crown region of the carcass and composed of at least three belt cord layers, a bead portion reinforcement comprised of a main chafer containing aromatic polyamide fiber cords and extending from a level lower than an upper end of the turnup portion along the turnup region of the carcass toward the inside of the tire, and an auxiliary chafer composed of plural cord layers containing cords having a modulus of elasticity lower than that of the cords in the main chafer, and extending downward from a level higher than the upper end of the turnup portion so as to overlappedly cover the upper end thereof and one end of the main chafer, said auxiliary chafer having at least first and second outer cord layers arranged outside the main chafer, in which at least one outer cord layer is wound along the turnup region of the carcass toward the inside of the tire, and at least third and fourth inner cord layers arranged along the inside of the turnup portion, wherein cords of first and second outer cord layers among the cord layers constituting the auxiliary chafer viewed from the outside of the tire crossed with each other with respect to the meridional plane of the tire and the cords of third and fourth inner cord layers also crossed with each other with respect to the meridional plane of the tire, and said auxiliary chafer has a triangular truss structure using a nodal point between the cord layers as a vertex in three cord layers among the above first to fourth cord layers.

4,811,774
TIRE CHANGER SAFETY ARM

James L. Dale; Bryce L. Mannen, and Raymond Titsworth, all of Conway, Ark., assignors to FMC Corporation, Chicago, Ill.

Division of Ser. No. 10,079, Feb. 2, 1987. This application Jul. 14, 1988, Ser. No. 219,025
Int. Cl.[4] B60C *25/00*
U.S. Cl. 157—1.1 5 Claims



1. Rim and tire assembly retention apparatus for a tire changing machine having a framework for mounting a rim and tire assembly support table and a tire inflator, comprising

a rigid member pivotally attached to the tire changing machine and being movable between a retention position overlying the support table and a remote position removed therefrom,

means for pivotally attaching said rigid member to the tire changing machine, said means for pivotally attaching having a substantially vertical pivot axis, and

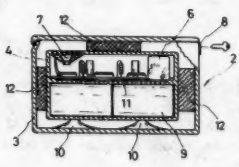
locking means disposed between said rigid member and the tire changer framework,

said locking means comprising a lock member, and locking cam means in contact with and interacting with said lock member in both said retention and remote positions, one of said lock member and locking cam means being attached to said framework and the other being attached to and movable with said rigid member for holding said lock member and thereby said rigid member alternately in said retention and remote positions.

4,811,775
APPARATUS FOR PREVENTING CRIMINAL'S ESCAPE OR VIOLENCE

Shin-Ching Sun, 3F., No. 32, 132nd Lane, Hu-Lin St., Taipei, Taiwan

Filed Feb. 18, 1988, Ser. No. 157,235
Int. Cl.[4] E05B *75/00*
U.S. Cl. 70—16 3 Claims



1. An apparatus for preventing a criminal's escape or violence comprising:

A. an action box connected to a handcuff or fetter, which comprises:

a steel housing made of alloy steel and forming a center hollow, which is able to endure any general bumps or knocks without being transformed or damaged, the housing being connected with a housing cover by closing a lock provided thereon;

an inner housing installed in said steel housing, which is made of an insulating material and forms a center hollow box, an outer rim of a bottom of the inner housing is provided with several suction disks to suction an inner bottom rim of said steel housing to buffer vibrations generated by bumping or knocking said steel housing, buffer sponge pieces being glued to other sides of said inner housing;

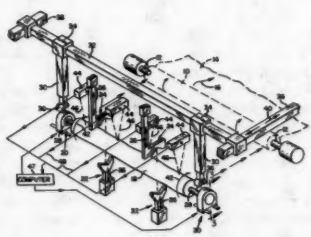
an integrated circuit board provided in said inner housing comprising a wireless receiving circuit for receiving a signal; a shock control circuit for controlling the generation of a shock, a buzzer device circuit for sounding a warning and a source battery for supplying power to the circuits; and

B. a control box held and used by an executor comprising a wireless transmit circuit for transmitting said signal and a shock control switch for generating a set shock order code and causing a shock to be generated.

4,811,776
APPARATUS AND METHOD FOR CENTERING LOGS

William E. Bolton, 2930 N.W. Skyline Dr., and John C. Holbert, 342 N.E. Plymouth Cir., both of Corvallis, Oreg. 97330

Filed Feb. 1, 1988, Ser. No. 150,937
Int. Cl.[4] B27B *1/00*; B27L *5/02*
U.S. Cl. 144—357 14 Claims



1. A centering apparatus for log processing comprising;

a pair of log end grippers for log scanning and positioning, each of said log end grippers having a first member rotatable about a fixed axis of rotation and a second member rotatable about a movable axis of rotation on the first member spaced from the fixed axis, a log-end-engaging spindle attached to the second member and being positioned over one of the axes of rotation to be rotated about said axis for scanning and to thereby determine a selected axis through the log, and

said spindle end pinning a log at its approximate geometric axis and a region on the log end surrounding the geometric axis designated as a region of adjustment, and a designated axis penetrating said region providing a replicate axis having a position fixed in space and at which the selected axis is to be positioned, and said selected axis within the region of adjustment movable about said fixed and movable axis of rotation of the first and second members, a circular path defined as a path about one of the fixed and movable axes of rotation represented by the distance of replicate axis from the said one axis of rotation whereby pivoting of the spindle and log end held thereby about one of the fixed and movable axes causes sweeping of the designated region of adjustment across the circular path for placement of the selected axis at a known position relative to the circular path, and rotation about the other of the fixed and movable axes places the selected axis at the replicate axis.

4,811,777

DEVICE FOR AT LEAST PARTLY CLOSING A VERTICAL OPENING IN A BUILDING AND ITS USE AS A MECHANICAL ANTI-FREEZE SHUTTER

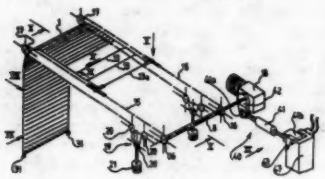
Michel J. E. Chretien, Saint Cyr l'ecole, France, assignor to MacGregor-Navire (F) S.A., France

Filed Jul. 8, 1987, Ser. No. 70,971

Claims priority, application France, Jul. 9, 1986, 86 10019; Jun. 30, 1987, 87 09247

Int. Cl.[4] E05D *15/16*

U.S. Cl. 160—201 13 Claims



1. A device for at least partly closing a vertical passageway opening in a building, comprising

a continuous transversely rigid and longitudinally flexible curtain guided on both sides by two lateral guideways,

each guideway comprising a vertical portion for a straight translatory motion for at least partially closing and opening said passageway opening and a substantially horizontal upper portion for a translatory storing motion and connected to the vertical portion through an arcuate intermediate portion,

control means for operating the motion of the curtain through drive means,

wherein said curtain is directly supported on each side by a curtain-carrying chain fitted with rollers riding in a corresponding lateral guideway secured to the edge of the curtain and extending over the whole length of the curtain and beyond an upper end of the curtain,

both chains being rigidly interconnected at their extensions by a plurality of bracing cross-members having an end bracing cross-member which is connected with its respective opposite ends, to the drive means associated with each curtain-carrying chain and extending horizontally and outside of the curtain.

4,811,778

METHOD OF MANUFACTURING A METAL ARTICLE BY THE LOST WAX CASTING PROCESS

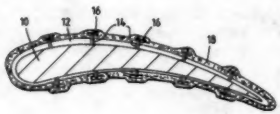
David J. Allen, Derby; Joseph Martin; Peter E. Rose, both of Staffordshire, and John Terry, Derby, all of England, assignors to Rolls-Royce PLC, London, England

Filed Apr. 4, 1988, Ser. No. 177,138

Claims priority, application United Kingdom, Jun. 3, 1987, 8712952

Int. Cl.[4] B22C *9/02*

U.S. Cl. 164—516 2 Claims



1. The method of manufacturing a metal article having a hollow therein by the lost wax process and comprising the steps of encasing a core in wax, inserting pins through the wax so that the inner end of each pin abuts the core and the outer end of each pen protrudes from said wax, the improvement comprising attaching heat-retaining caps on the outer ends of said pins in spaced relationship from the wax, encapsulating the wax, the pins and the core encased within the wax in a ceramic slurry, drying the slurry, thereafter melting the encasing wax and removing it from within the hardened slurry, and finally, pouring molten metal into the space defined by the harden slurry.

4,811,779

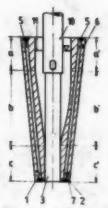
MOLD FOR THE CONTINUOUS CASTING OF STEEL STRIP

Hans Streubel, Erkrath; Rainer Golla, Dusseldorf, and Manfred Kolakowski, Erkrath, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Dec. 7, 1987, Ser. No. 129,247

Int. Cl.[4] B22D *11/00*

U.S. Cl. 164—418 3 Claims



1. A mold for continuously casting strip metal in which said mold is arranged with a mold cavity having a longitudinal axis parallel to the casting direction and a portion centrally of and in the upstream area of said mold dimensioned to accomodate a pouring tube positioned in the upstream area of said cavity during casting, the width of said cavity in said upstream area being sufficient to provide equal to, or greater than, a required minimum spacing between said pouring tube and the walls of said mold, said mold comprising:

(a) side and end walls for said mold arranged respectively to define said cavity and positioned to make the cross-section of said cavity shaped generally as a parallelepiped have substantially the same dimensions as the strip being cast, and said cavity also having a flared area in the upper central area of said mold to accomodate the pouring tube, said side walls being tapered inwardly from the upper part of the mold to a lower point at which the cross-section of the mold approximates the size and shape of the strip being cast; and

(b) a strand shell formation initializating zone in said flared area having walls extending substantially parallel with the longitudinal axis of said mold, the parallel wall zone extending up to the top of the mold, and the complete dimension of the parallel wall zone being between 150 and 350 mm.

4,811,780

CONTINUOUS CASTING APPARATUS FOR METAL STRIP

Takashi Yamauchi; Morihiro Hasegawa, and Ryuichi Akiyama, all of Yamaguchi, Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1988, Ser. No. 171,470

Claims priority, application Japan, Apr. 8, 1987, 62-84555

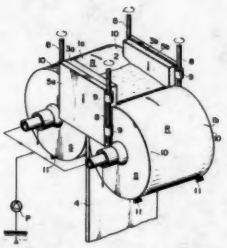
Int. Cl.[4] B22D *11/06*

U.S. Cl. 164—428 3 Claims

1. A continuous casting apparatus for metal strip, in which a pair of internal cooling rolls rotating in the opposite direction to each other and having horizontal axes respectively are

disposed opposite to each other and a pair of side dams are disposed spaced from each other by a distance approximately corresponding to the width of cast strip in order to form a metal pool on the circumferential surfaces of the pair of rolls, thereby continuously casting the metal strip from molten metal in the metal pool through the gap between the pair of rolls, characterized in that:

the side dams are disposed such that at least a portion of the bottom contacts the circumferential surface of the roll so as to allow at least a portion of thickness of the side dam to locate on the circumferential surface of the roll;



the bottom surfaces of the side dams contacting at least the circumferential surface of the roll during the casting are made of refractories having satisfactory abrasiveness:

a mechanism is provided for feeding the side dams in the casting direction at a predetermined speed; and

the circumferential surface portion of the roll contacting the side dam is formed into a rough surface having grindability;

whereby the movement of the side dam by the feeding mechanism is carried out through the wear of the side dam ground by the rough surface.

4,811,781

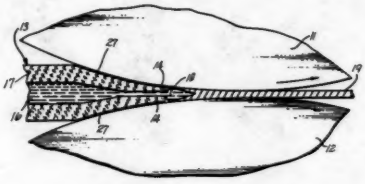
FEED TIP AND CONTINUOUS CASTING METHOD USING THE FEED TIP

Christopher A. Romanowski, Lake Arrowhead, and Herman Landero, Colton, both of Calif., assignors to Hunter Engineering Company, Inc., Riverside, Calif.

Filed Mar. 17, 1988, Ser. No. 169,870

Int. Cl.[4] B22D *11/06, 11/10*

U.S. Cl. 164—480 **7 Claims**



1. A feed tip suitable for use in the continuous casting of molten metal comprising:

a pair of spaced rigid refractory bodies defining a feed path for molten metal, each refractory body having an upstream portion and a downstream edge, and which bodies taper, in cross-section, in a direction towards the downstream edge to define a discharge gap for the tip;

said feed tip being formed from a material comprising a blend of aluminosilicate fibers, silica powder and a boron constituent heated to a sufficiently high temperature to form a rigid body.

4,811,782

PROCESS FOR THE INTRODUCTION OF CHEMICAL-METAL ELEMENTS IN METAL FOUNDINGS

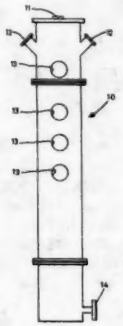
Giuseppe Sola, Modena, Italy, assignor to NECCHI Societa per Azioni, Pavia, Italy

Continuation of Ser. No. 22,627, Mar. 5, 1987, abandoned. This application Feb. 4, 1988, Ser. No. 153,461

Claims priority, application Italy, Apr. 22, 1986, 42908 A/86

Int. Cl.[4] B22D *27/00, 27/02*

U.S. Cl. 164—495 **4 Claims**



1. Process for the introduction of entrained plasma-state metal elements into cast iron or steel metal melt, comprising bringing portions of metal electrodes to a plasma state between said electrodes while arcing, passing an inert gas past said metal electrodes to entrain said metal in plasma state and injecting said inert carrying gas and entrained metal in plasma state into said metal melt.

4,811,783

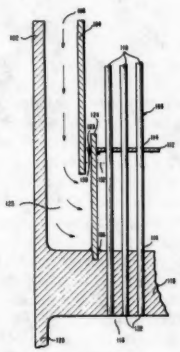
HEAT EXCHANGER TUBE BUNDLE PROTECTION APPARATUS

Frederick D. Linzer, Monroeville, Pa., and Paul L. Hauck, Tampa, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 671,821, Nov. 15, 1984, abandoned. This application Oct. 8, 1987, Ser. No. 106,900

Int. Cl.[4] F28F *19/00*

U.S. Cl. 165—134.1 **18 Claims**



1. An improved heat exchanger of the type in which a bundle of heat transfer tubes arranged in an array having a minimum pitch is contained within a housing, and in which an

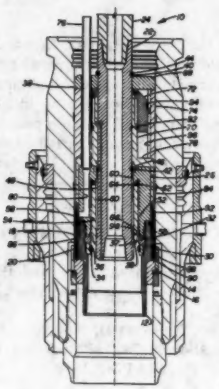
opening is provided within said housing for the flow of a fluid over said tubes, wherein the improvement comprises protecting means arranged at the periphery of a portion of said bundle adjacent said opening for protecting said tubes from contact with solid debris within said fluid, while allowing the low of said fluid therethrough, said protecting means arranged spaced from said tubes in an array having a pitch corresponding to said minimum pitch of said tubes, the array of said protecting means and the array of said tubes forming a combined array of protecting means and tubes having a uniform pitch throughout corresponding to said minimum pitch of said tubes.

4,811,784

RUNNING TOOL

David H. Theiss, Houston, Tex., assignor to Cameron Iron Works USA, Inc., Houston, Tex.

Filed Apr. 28, 1988, Ser. No. 187,572
Int. Cl.[4] E21B *23/02, 23/04, 33/128*
U.S. Cl. 166—208 **6 Claims**



1. A running tool for lowering and manipulating structures within a well comprising

a mandrel having means for connecting to a running string at it upper end,

a tool body surrounding said mandrel and having radially extending windows through its lower portion,

latch dogs carried in the tool body windows,

an actuator ring positioned between said body and said mandrel and being movable axially to engage said latch dogs and wedge them outward into latching position,

means interconnecting said actuator ring, said tool body and said mandrel for moving said actuator ring to and from its latching position with respect to said latch dogs,

means interconnecting said actuator ring and said mandrel for limiting movement of said mandrel downwardly with respect to said actuator, and

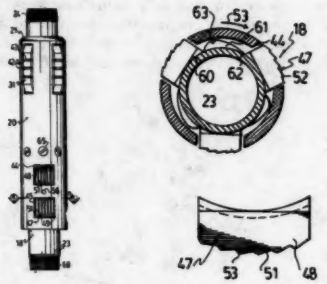
means on said tool body to release said mandrel movement limiting means to allow said mandrel to move downward within said actuator ring whereby said mandrel may be manipulated in a lowered position to position said well structures carried thereby subsequent to the landing.

4,811,785

NO-TURN TOOL

James L. Weber, Weyburn, Canada, assignor to Halbrite Well Services Co. Ltd., North Battleford, Canada

Filed Jul. 31, 1987, Ser. No. 80,754
Int. Cl.[4] E21B *23/00*
U.S. Cl. 166—242 **8 Claims**



1. A no-turn tool comprising in combination a slip housing and a drag block housing secured to the upper end of said slip housing, an inner mandrel within said slip and drag block housings, drag blocks extending through the wall of said drag block housing and, a plurality of well casing engaging slips mounted within said slip housing and extending through apertures within said slip housing, spring means acting between said slip housing and said slips normally retracting said slips, and cam means including a cam lobe for each slip extending radially from said inner mandrel with an outer profile that increases anti-clockwise around the mandrel as viewed from above, whereby each cam lobe engages the associated slip in response to right-hand rotation of said mandrel relative to said slip housing, thereby urging said slips outwardly through the apertures within said slip housing and into engagement with an associated well casing, each said slip having a serrated outer face forming vertically oriented wickers extending along the mandrel, the leading outer edges of said serrations being situated to engage the wall of the well casing when urged outwardly by said cams, thereby preventing right-hand movement of said mandrel in the well casing.

4,811,786

DOWNHOLE GASEOUS LIQUID FLOW AGITATOR

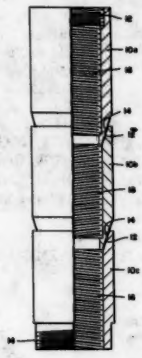
G. N. Kamilos, Dublin; D. D. Kennedy, and L. J. Lederhos, Jr., both of Bakersfield, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 31, 1985, Ser. No. 794,341
Int. Cl.[4] E21B *43/24;* B01F *03/02*
U.S. Cl. 166—303 **14 Claims**

1. An apparatus for agitating and mixing a gaseous phase and a liquid phase comprising:

a first tube having non-blocking internal threads within said first tube to agitate a liquid phase adhering thereto with a

gaseous phase passing therethrough, whereby a uniform gaseous phase and liquid phase mixture is formed; and



a second tube connected to an end of said first tube having non-blocking internal threads of opposite handedness.

4,811,787

METHOD FOR REDUCING THE PERMEABILITY OF UNDERGROUND STRATA DURING SECONDARY RECOVERY OF OIL

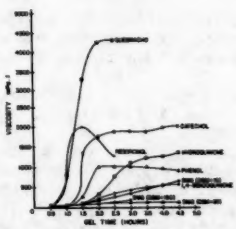
Martin Navratil, West Hill; Jimmy P. Baytycky, Calgary; Mojmir Sovak, Toronto, and Mark Mitchell, London, all of Canada, assignors to Borden Company Limited, West Hill, Canada

Division of Ser. No. 901,985, Sep. 2, 1986, abandoned, which is a continuation of Ser. No. 613,897, May 24, 1984, abandoned, which is a continuation-in-part of Ser. No. 397,452, Jul. 12, 1982, abandoned. This application Feb. 8, 1988, Ser. No. 154,467

Claims priority, application Canada, Mar. 11, 1982, 398179

Int. Cl.[4] E21B *33/138, 43/22*

U.S. Cl. 166—273 **44 Claims**



1. A method for adjusting the fluid permeability of a high fluid permeability zone in an oil-bearing stratum, said zone having greater fluid permeability than the surrounding zones of said stratum, which method comprises:

injecting into said oil-bearing stratum via a well penetrating said stratum an aqueous, alkaline gelable solution, said solution comprising an gelable solution, said solution comprising an alkaline material, a polyphenolic vegetable material selected from the group consisting of tannin extracts, catechins and alkaline extracts of coniferous tree barks, said polyphenolic material being soluble in alkaline solution, and formaldehyde, said formaldehyde being present as formaldehyde itself, paraformaldehyde, urea-formaldehyde concentrate, hexamethylenetetramine or a phenol-formaldehyde resole, the total active solids content of said solution being from about 1 to about 33% by weight of said solution said solution having a pH of at least about 9.5 and being formed by dissolving said alkaline material, said polyphenolic vegetable material and said formaldehyde in a brine containing not more than about 0.275 percent by weight of cations having a valency greater than one and forming insoluble hydroxides, the gelling time of said solution and the rate of injection thereof being such that said solution passes down said well by which it is injected and achieves substantial penetration into said high fluid permeability zone before substantial gelling of said solution occurs; and

allowing said solution to gel within said high fluid permeability zone, thereby reducing the fluid permeability of said zone.

4,811,788

SURFACTANT COMBINATIONS AND ENHANCED OIL RECOVERY METHOD EMPLOYING SAME

Bayram Kalpakci, Sagamore Hills, and Yvonne Jeans, Shaker Hts., both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

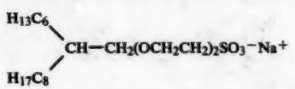
Filed Feb. 13, 1986, Ser. No. 829,431

Int. Cl.[4] E21B *43/22*

U.S. Cl. 166—246 **16 Claims**

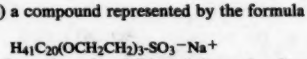
1. A method of recovering oil from a subterranean formation comprising injection into said formation an aqueous composition comprising a surface-active amount of a composition comprising:

(A) a compound represented by the formula



and

(B) a compound represented by the formula



the mole ratio of (B) to (A) ranging from about 0.02 to about 7, said method further comprising the step of driving said oil toward one or more production wells.

4,811,789

MINIMIZING FORMATION DAMAGE UNDER ADVERSE CONDITIONS DURING GRAVEL PACK OPERATIONS

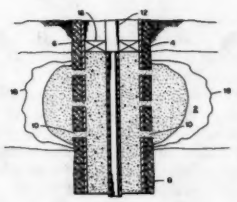
Alfred R. Jennings, Jr., Plano, Tex., and Paul Shu, Princeton Junction, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 769,223, Aug. 26, 1985, Pat. No. 4,664,191, and Ser. No. 917,324, Oct. 9, 1986. This application May 12, 1987, Ser. No. 49,193

The portion of the term of this patent subsequent to May 12, 2004, has been disclaimed.

Int. Cl.[4] E21B *43/04*

U.S. Cl. 166—276 **27 Claims**



1. A method for minimizing formation damage caused by

intrusive fluids prior to a gravel packing operation in loosely consolidated formations penetrated by at least one well comprising:

(a) filling the casing of said well with an underbalanced completion fluid;

(b) placing within said well a removable packer capable of isolating the space between said casing and the formation from the downhole well pressure;

(c) setting through said packer a first tubing suitable for perforating and stabilizing the flow of fluids into said well;

(d) perforating said casing;

(e) introducing a blocking agent into said formation via the perforations which agent upon solidification is sufficient to minimize formation damage by avoiding the introduction of formation fluids where said agent is as gel comprising:

(i) water,

(ii) 0.2 to 5.0 wt. percent of a cross linkable polymer having at least one functional group selected from a member of the group consisting of an amine, an amide, a hydroxyl, or a thiol group, and

(iii) 0.2 to 50.0 wt. percent of a partially methylated aminoplast resin which cross links with said polymer;

(f) causing said blocking agent to solidify while forming a solidified plug within said well and a solid mass within the adjacent washed out portion of said formation;

(g) removing said first tubing from said well;

(h) placing within said well a second tubing having a slotted portion therein sufficient to allow gravel packing of the well and the formation;

(i) removing said solidified plug from said wellbore along with solidified gel from said washed-out portion of the formation; and

(j) placing a gravel pack within said well and said washed out portion of the formation via said second tubing which consolidates said formation.

4,811,790

WELL BORE DEVICE AND METHOD FOR SAND CONTROL

Alfred R. Jennings, Jr., and Lawrence R. Stowe, both of Plano, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 27, 1987, Ser. No. 90,063
Int. Cl.[4] E21B *43/08*
U.S. Cl. 166—278 **18 Claims**

1. A process for removing particulate matter or formation fines during the production of hydrocarbonaceous fluids from a formation where a production tubing string is used in a wellbore comprising:

(a) forming a cylindrically shaped retainer having one closed and one open end, with an inner and outer wall of similar construction having a space therebetween as one end of each said wall is affixed to said closed end of said retainer and the opposite end of each said wall is in fluid communication with a producting tubing string;

(b) placing within said retainer an open ended fused porous refractory tube of a size sufficient to fit within the space formed by said walls thereby protecting said tube from shock and facilitating removal of said tube for replacement or cleaning;

(c) fluidly communicating said retainer with said refractory tube therein, with said production string; and

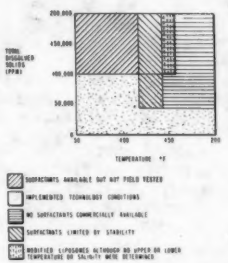
(d) directing said production string to the producing interval in said formation and removing hydrocarbonaceous fluids from said formation while excluding entry of said fines from said fluid via the refractory tube.

4,811,791

ENHANCED OIL RECOVERY

Gideon N. Harnoy, P.O. Box 6039, Ramat-Efal, Israel (52960); Shimon Gatt, 60 Hechlutz Street, Jerusalem, Israel (96269), and Yechezkel Barenholtz, 18 Neve-Shanan, Jerusalem, Israel (93707)

Filed Aug. 4, 1987, Ser. No. 81,395
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—305.1 **6 Claims**



1. A method of recovering a petroleum from an underground source thereof comprising injecting into said underground source a petroleum displacement agent comprising a fluid and a modified liposome, said liposome being present in an amount sufficient to lower the interfacial tension between said fluid and said petroleum to below about 10 millidynes.

4,811,792

WELL TOOL STABILIZER AND METHOD

Jeffrey J. Lembcke, and Brian Shaw, both of Broken Arrow, Okla., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Mar. 7, 1988, Ser. No. 164,867
Int. Cl.[4] E21B *17/10, 23/00*
U.S. Cl. 166—381 **10 Claims**

1. A stabilizer housing for a well tool mounted in a cased subterranean well comprising, in combination:

a tubular body connectable in co-axially aligned series relationship to the well tool;

said tubular body having a plurality of peripherally spaced, longitudinal slots extending through the wall of said tubular body;

a radially expandable linkage disposed in each said longitudinal slot;

means for pivotally securing one end of each said linkage in one end of the respective longitudinal slot, whereby axial movement of the other end of each said linkage relative to said tubular body shifts said linkage from a radially contracted run-in position to a radially expanded position;

resilient means urging said other ends of said linkages to said radially expanded position;

anti-friction means carried by each said linkage engageable with the well casing wall in said radially expanded position;

releasable means for securing said linkages in said radially retracted position to permit run-in and positioning of the well tool prior to any radial expansion of said linkages;

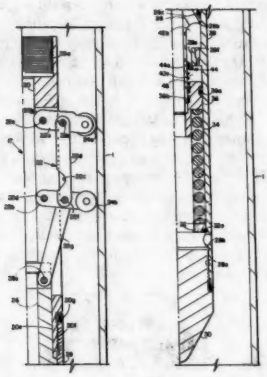
said resilient means comprising a compression spring mounted within the bore of said tubular body;

means in the bore of said tubular body defining an abutment engaging one end of said compression spring;

a sleeve slidable in the bore of said tubular body and having means on said sleeve engagable with said compression spring; and

means for pivotally connecting the other ends of said linkages to said sleeve, whereby said compression spring concurrently urges all of said linkages to said radially expanded positions.

9. The method of stabilizing a downhole well tool relative to a well conduit surrounding the tool, comprising the steps of:



connecting a tubular housing in series relation to the well tool, said tubular housing carrying a plurality of peripherally spaced, radially shiftable linkages, said linkages being concurrently radially expandable to engage the wall of the surrounding well conduit;

securing said linkages in a radially retracted position by means releasable adjacent the downhole position of the tubular housing;

running the well tool downhole with said linkages in said radially retracted position, thereby minimizing frictional contact of said linkages with the conduit wall during run-in of said downhole well tool and

hydraulically limiting the rate of radial expansion of said linkages.

4,811,793

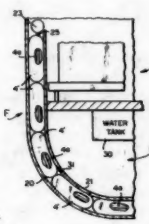
FIRE DAMAGE CONTROL SYSTEM FOR AIRCRAFT

Oddvin Lokken, 131 Forest Ave., Rye, N.Y. 10580

Filed Apr. 3, 1987, Ser. No. 34,788

Int. Cl.[4] A62C *3/08*

U.S. Cl. 169—48 **12 Claims**



1. Apparatus for shielding an area of an aircraft from adverse effects of a fire, which comprises wall means for enclosing at least a portion of the area of the aircraft to be shielded, a highly water-absorbent polymer capable of absorbing at least about 500 times its weight of water operatively associated with said wall means, a reservoir for storing water, conduit means for establishing liquid communication between said reservoir and said polymer, and delivery means for flowing water from said reservoir to said polymer via said conduit means.

4,811,794

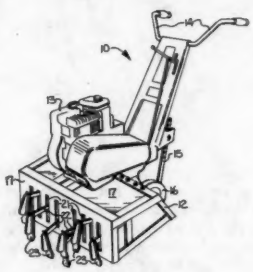
GARDEN TILLER WITH RECIPROCATING TINES

Benjamin F. Greene, Rte. 1, Box 52-E, McConnells, S.C. 29726

Filed Nov. 24, 1986, Ser. No. 934,152

Int. Cl.[4] A01B *33/00*

U.S. Cl. 172—43 **5 Claims**



1. A manually controlled garden tilling apparatus which comprises a tiller frame, handles carried by and extending rearwardly and upwardly from said frame for facilitating manual guidance and control of the garden tilling apparatus, a plurality of movable arms carried by said frame and extending forwardly therefrom, soil-working tines extending downwardly from the forward-most portion of said movable arms to engage the soil, a crankshaft mounted transversely inside said frame, a protective housing carried by said frame and substantially enclosing said crankshaft and said frame, said protective housing including a series of laterally spaced apart openings, with said movable arms extending respectively outwardly through said openings so as to position said tines for engagement with the soil, said tines being the only structure extending below said housing forwardly of the rear of said housing, a drag bar extending downwardly from the frame and positioned rearwardly of the housing to engage the soil for stabilizing the apparatus, a motor carried by said frame, a transmission interconnecting said motor and said crankshaft to rotate said crankshaft, means for coupling said movable arms to said crankshaft at a location medially of the opposite ends of the arms, and a mounting link pivotally connecting each of said movable arms to said frame, one end of said link being pivotally connected to said frame at a location generally above the point of connection of the link to said arm, and whereby upon rotation of the crankshaft, the soil-working tines are moved in a closed, generally elliptical path of travel to contact the soil.

4,811,795

SEED DRILL

Malcolm Dean, Allesley, and Kenneth I. Withers, Baginton, both of England, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Oct. 30, 1987, Ser. No. 114,948

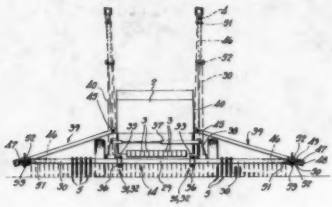
Claims priority, application United Kingdom, Oct. 30, 1986, 8625976

Int. Cl.[4] A01B *63/00*

U.S. Cl. 172—456 **7 Claims**

1. A seed drill comprising a frame, a beam that is mounted on

the frame so as to extend transversely of the direction of forward motion of the drill from one side to the other and that has a plurality of coulters mounted along the beam so as to trail therefrom and engage the ground when in work, the beam comprising a central beam portion and an outer beam portion on each side having an outer end and an inner end with a pivotal connection to the central beam portion so that the outer beam portion is pivotable upwards from a work position to a transport position, a strut assembly at each side of the drill having at an inner end an inner pivotal connection to the frame and having at an outer end an outer pivotal connection to the outer end of the outer beam portion so as to be inclined down-



wards towards said outer end when the outer beam portion is in the work position and so that the strut assembly pivots upwards with the outer beam portion to the transport position, said outer pivotal connection between the strut assembly and the outer beam portion comprising an elongated member that is pivotally connected to the outer end of the strut assembly and is slidably received within the outer end of the outer beam portion so as to telescope therewith as the outer beam portion and strut assembly are raised and lowered, and releasable retaining means that serves to hold the elongated member against withdrawal from the outer beam portion when both are lowered.

4,811,796

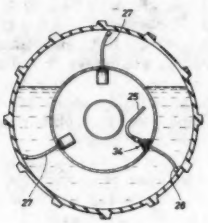
FIRE FIGHTING APPARATUS

Stephen D. Allen, P.O. Box 607, Tomball, Tex. 77375

Filed Aug. 17, 1987, Ser. No. 85,806

Int. Cl.[4] A62C *35/12*

U.S. Cl. 169—62 **11 Claims**



1. For use in fighting fire in and around a self-propelled vehicle having large tubeless tires in which a liquid ballast may be contained, apparatus comprising

a wheel having a rim on which one of said tires may be mounted,

means forming a plurality of holes spaced generally equally about the rim to connect with the interior of the tire,

a plurality of fittings each having inner and outer ends and a bore therethrough and means thereon for connection to a hole forming means,

a plurality of flexible tubes each having one end connectible to the inner end of a fitting to dispose its other end near the inner side of the tire when fully inflated and upon connection of the tube to means forming one of the holes and being free to pass through the hole as the fitting is connected to and disconnected from the means forming the hole,

each said fitting having a bore therethrough adapted to open to the tube to which it connects and an inwardly facing seat about the bore and a closure member yieldably urged toward a seated position to close the bore,

a plurality of couplings each adapted to be moved into an inner position within the outer end of the bore of a fitting to engage and move the closure member to an unseated position, and

means on each fitting and coupling adapted to releasably attach the coupling to the fitting in its inner position,

each said coupling having a bore therethrough which opens to the fitting bore when attached thereto and means on its outer end to which a firs those may be connected in order to permit fire-fighting liquid to be added to a lower portion of the tire through one of said fittings to which one of the couplings is connected, as the space within the upper portion of the tire is vented through another fitting to which another coupling is connected, to which an air line may be connected for supplying air to the tire through a fitting to which the coupling is connected in order to pressurize the liquid in the tire, or to which a second hose having a nozzle on its outer end may be connected in order to dispense such pressurized liquid from the tire and through the fitting to which the coupling is connected upon opening of the nozzle.

4,811,797

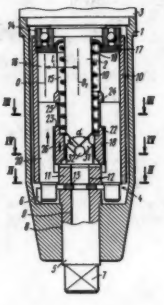
IMPACT WRENCH

Georgy A. Antipov; Mikhail L. Gelfand; Boris G. Goldshtein; Gennady A. Korniliev, all of Moscow; Nikolai S. Lavnikov, Rostov-na-Donu; Yakov I. Tsipenjuk, Moscow, and Petr S. Yakubovsky, Rostov-na-Donu, all of U.S.S.R., assignors to Nauchno-Proizvodstvennoe Obiedinenie Po Mekhanizirovannomu Stroitelnomu Instrumentru I Otdelochnym Mashinam, Moscow, U.S.S.R.

Filed Oct. 21, 1987, Ser. No. 111,936

Int. Cl.[4] B25D *15/00*

U.S. Cl. 173—93.6 **8 Claims**



1. An impact wrench, comprising:

a casing;

an anvil rotatably mounted in said casing and having a portion for the attachment of a socket wrench;

a shaft rotatably mounted in said casing;

a drive coupled to said shaft to impart rotation thereto;

a hammer mounted in said casing;

a body of said hammer;

an axial passage in said hammer body;

at least two longitudinally extending passages in said hammer body, opening into said axial passage;

an end of said hammer body facing towards an anvil;

pins of said hammer, each pin being received in said longitudinally extending passage for axial reciprocation between a position, in which the pins are engaged with an anvil, and a position, in which said pins are disengaged from said anvil;

a driving member of said hammer, said driving member being received in said axial passage of the hammer body and coupled to said shaft so as to perform rotation and axial movement between two positions;

said driving member being guided in said axial passage of each said hammer body;

a bearing surface of each said driving member;

a portion of said pin protruding into said axial passage of said hammer body;

a bearing surface of said pin, said bearing surface being located on said portion protruding into said axial passage of said hammer body so as to engage said bearing surface of said driving member during its movement into a position, in which said pins are disengaged from the anvil;

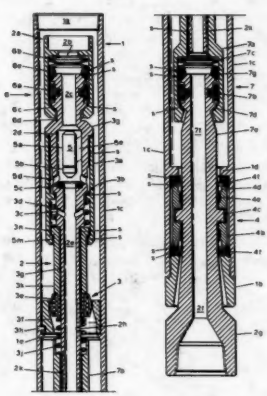
a spring disposed in said casing and adapted to cooperate with said driving member for moving it into a position, in which said pins are engaged with said anvil.

4,811,798

DRILLING MOTOR DEVIATION TOOL

Thomas E. Falgout, Sr., Youngsville, and William N. Schoeffler, Lafayette, both of La., assignors to Team Construction and Fabrication, Inc., Youngsville, La.

Filed Oct. 30, 1986, Ser. No. 924,908
Int. Cl.[4] E21B *17/10*
U.S. Cl. 175—73 **21 Claims**



1. An extension for a down hole drilling motor to adapt the motor for selective configuration for straight hole drilling or directional drilling, selectively, the apparatus comprising:

(a) an elongated generally tubular body, adapted at a first end to rigidly attach to the lower end of a down hole drilling motor housing, said body having an opening extending along the general centerline of said body;

(b) fluid channel means situated in said copening to conduct drilling fluid from said motor fluid output means to a downwardly continuing drill string element;

(c) output shaft means situated in said body and extending from a second end of said body, said output shaft adapted at the extended extreme for attachment to a downwardly continuing drill string element;

(d) deflection enabling means mounted in said body near said second end operatively associated with said output shaft and adapted to axially support said output shaft for rotation, and operatively associated with said body to permit change of the direction, relative to the body general centerline, of the axis of rotation of said output shaft;

(e) selector valve means situated in said body, operatively associated with drilling fluid channels in said body, responsive to drilling fluid flow to produce a first output signal in response to fluid flow manipulations having a first characteristic and to produce a second output signal in response to fluid flow manipulations having a second characteristic;

(f) actuator means situated in said body, operatively associated with said deflector means, responsive to said first signal to cause the rotational axis of said output shaft to be generally coincidental with the extended centerline of said body and responsive to said second signal to cause said rotational axis of said output shaft to be deflected from the extended body centerline;

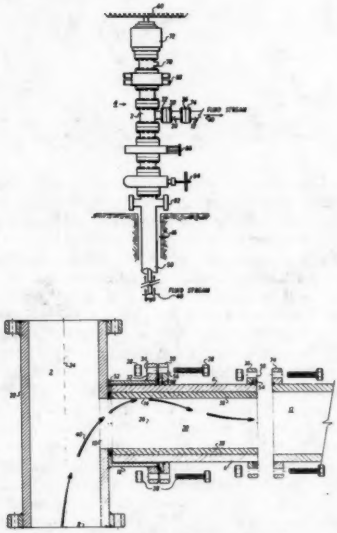
(g) driveshaft connector means in said opening, operatively associated with the output shaft of said motor and said output shaft means to connect the two for sympathetic rotation.

4,811,799

BANJO BOX AND BLOOIE LINE SPOOL

Wayne V. Blackwell, Kelseyville, and William P. Warren, Santa Rosa, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Feb. 27, 1987, Ser. No. 19,585
Int. Cl.[4] E21B *21/00*
U.S. Cl. 175—209 **14 Claims**



1. Apparatus for changing the direction of flow of a stream of particulate-laden, pressurized fluid, said apparatus comprising:

(a) a first fluid flow conduit having a fluid flow inlet at one end region thereof and a fluid discharge opening formed through a side wall thereof;

(b) a second fluid flow conduit connected to the outside of said first conduit at said sidewall opening to receive the flow of liquid discharged therethrough;

(c) a third fluid flow conduit, said third conduit having at at least one end region sized to slidingly fit into said second conduit and having an inner wear surface for deflecting the fluid flow from the first conduit through a substantial angle, the third flow conduit comprising a tubular member having first and second, axially spaced apart, annular

sealing flanges extending radially outwardly therefrom;
(d) a fourth fluid flow conduit; and
(e) first connecting means for releasably connecting said third conduit, in a fluid-tight relationship, to said second conduit with said one end slidingly fit thereinto and with a discharge end of the third conduit extending outwardly therefrom a substantial distance, and second connecting means for separately and releasably connecting the discharge end of the third conduit, in a fluid-tight relationship, to the fourth conduit,
said first and second connecting means being configured for permitting said third conduit to be rotated relative to the second conduit so as to expose different regions of the wear surface to impingement of the fluid flow from the first conduit without removing the third conduit from either the second or the fourth conduits, said first connecting means comprising first clamping means for releasably clamping said third conduit first sealing flange to said second conduit and said second connecting means comprising second clamping means for releasably clamping said third conduit second sealing flange to said fourth conduit.

4,811,800

FLEXIBLE DRILL STRING MEMBER ESPECIALLY FOR USE IN DIRECTIONAL DRILLING

Guy J. Hill, Friendswood; Homer G. Smith, Jr., Houston; Mark W. Schnitker, Missouri City, and Glenn E. Beatty, Houston, all of Tex., assignors to Homco International Inc., Bellaire, Tex.

Filed Oct. 22, 1987, Ser. No. 111,222
Int. Cl.[4] E21B *17/22*; B23P *21/00*
U.S. Cl. 175—323 **14 Claims**

1. A drill string member for drilling deviated holes to be interposed in a drill string, said drill string having a downhole or bit end and a surface or upper end, said member being interposed between a downhole motor driven bit at said bit end and drill pipe at said upper end, said drill string member having a weight per unit length slightly more than that of said drill pipe, said drill string member comprising tool joint means at each end thereof and a main body portion there between, said main body portion of said drill string member being formed with at least one spiral groove extending over the entire length of said main body portion and covering substantially the entire distance on said member between said tool joint means, said spiral groove defining lands on said main body portion between the flights thereof and being formed in said main body portion such that the maximum depth of said spiral groove being in the range of about 55% to about 85% of the wall thickness of the body measured from the O.D. of said land to the I.D. of said member, and said drill string member being made in such a way that the difference in the maximum stress in said lands and in said groove produced in said member due to bending loads produced during drilling said deviated holes is equal to or less than 43,000 psi.

4,811,801

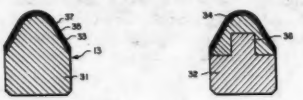
ROCK BITS AND INSERTS THEREFOR

William J. Salesky, Irvine, Calif., and Bruce L. Campbell, Pleasant Grove, Utah, assignors to Smith International, Inc., Irvine, Calif.

Filed Mar. 16, 1988, Ser. No. 169,232
Int. Cl.[4] C22C *29/08*; E21B *10/52, 10/56*
U.S. Cl. 175—329 **60 Claims**

1. An insert for a roller cone rock bit adapted to drill with mud comprising:
an insert body having a shaft portion for insertion into a roller cone and a head portion for protruding from the roller cone; and
a layer of polycrystalline diamond material directly bonded to the head portion;
wherein the head portion comprises a material having a Young's modulus of elasticity between about 80 and about 89×10^6 p.s.i, and a coefficient of thermal expansion of between about 2.9 and $3.4\times10-6$ /°C.

21. An insert for a roller cone rock bit adapted to drill with air comprising:
an insert body having a shaft portion for insertion into a roller cone and a head portion for protruding from the roller cone; and
a layer of polycrystalline diamond material directly bonded to the head portion;
wherein the head portion comprises a material having a Young's modulus of elasticity between about 90 and about 102×10^6 p.s.i, and a coefficient of thermal expansion of between about 2.5 and about 3.0×10^{-6}/°C.



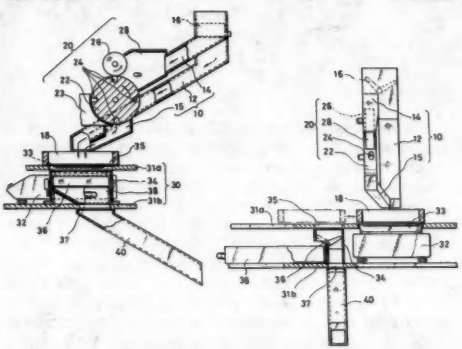
41. An insert for a percussion rock bit comprising:
an insert body having a shaft portion for insertion into the percussion rock bit and a head portion for protruding from the roller cone: and
a layer of polycrystalline diamond material directly bonded to the head portion:
wherein the head portion comprises a material having a Young's modulus of elasticity between about 90 and about 102×10^6 p.s.i and a coefficient of thermal expansion of between about 2.5 and about 3.0×10^{-6}/°C.

4,811,802

METHOD AND APPARATUS FOR CONTROLLING A CAPSULE FILLING MACHINE

Taizo Yamamoto, Osaka; Hirokazu Konishi, Sakurai; Yoshihisa Kawaguchi, and Yoshizumi Ohnishi, both of Kashihara, all of Japan, assignors to Nippon Elanco Kabushiki Kaisha, Osaka, Japan

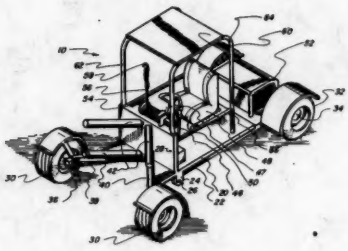
Filed May 31, 1988, Ser. No. 200,414
Claims priority, application Japan, Jun. 11, 1987, 62-146144
Int. Cl.[4] G01G *19/52*
U.S. Cl. 177—1 **9 Claims**



1. In a method for controlling a metering operation in a capsule filling machine based on a correction signal which is derived by sampling/weighing the capsules filled with material in the machine and ejected therefrom and by processing the weight value to generate the signal, the method which comprises; performing two kinds of sampling/weighing selectively

and in sequence, the first one being collective weighings of a plurality of capsules sampled in bulk at once and the second one being individual and intermittent weighings of each capsule from the bulk one by one.

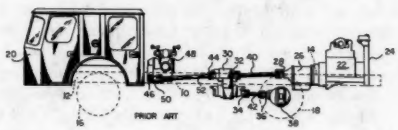
4,811,803
DEER STAND
James Green, 5652 Post Rd., Cumming, Ga. 30130
Filed Nov. 10, 1987, Ser. No. 119,193
Int. Cl.[4] B62D *63/00;* **A01M** *31/02;* **A45F** *3/26*
U.S. Cl. 180—7.5 **10 Claims**



1. A deer stand for elevating hunters above the ground comprising:
an upper chassis plate;
a lower chassis plate hingedly connected to said upper chassis plate;
an upright front frame mounted on said upper chassis plate;
a seat rotatably attached to said upper chassis plate;
a plurality of platform support bars having a horizontal upper portion, a forward vertical portion fixedly mounted to the top of said upright front frame, and a rear vertical portion fixedly mounted to said upper chassis plate;
a platform mounted on the flat upper portion of said platform support bars;
wheel and axle means having a pair of front wheels mounted on separate short axles and a pair of rear wheels mounted on a long axle secured to said lower chassis plate;
link means to secure said front axles to said upper chassis plate;
a plurality of bar and roller assemblies mounted at an acute angle with respect to said upright front frame;
a winch and cable assembly means for raising said deer stand off the ground;
said winch and cable assembly means comprising a winch and a cable;
hook means attached to the free end of said cable;
belt means for securing said hook means to a tree;
motor means to enable said deer stand to be propelled over the ground; and
steering means to control the direction of movement of the deer stand.

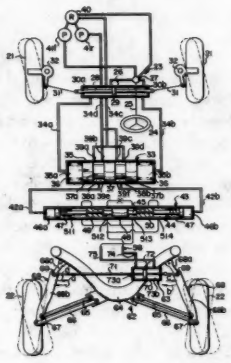
4,811,804
FIRE TRUCK WITH REAR-MOUNTED ENGINE
Ronald L. Ewers, and William F. McCombs, Ocala, both of Fla., assignors to Emergency One, Inc., Ocala, Fla.
Filed Dec. 8, 1986, Ser. No. 939,070
Int. Cl.[4] B60K *17/28*
U.S. Cl. 180—53.8 **4 Claims**

1. A fire truck comprising, in combination, an elongated frame having a front region and a rear region, a passenger cab mounted on said frame front region, steerable wheels mounted on said frame front region, drive wheels mounted on said frame rear region, a differential drivingly associated with said drive wheels having an input shaft extending toward said frame front region, an engine mounted on said frame rear region, a transmission mounted on said frame rear region operatively connected to said engine and having an output shaft extending toward said frame front region, a fire pump drive gear box mounted on said frame forwardly of said drive wheels and said differential and having a front side facing said frame front region and a rear side facing said frame rear region and including an input shaft extending rearwardly toward said transmission having an adapter adjacent said gear box rear side, an output shaft extending rearwardly toward said differential having an adapter adjacent said gear box rear side and a fire pump drive shaft, shiftable power drive means selectively connecting said gear box input shaft to said gear box output



shaft and directly to said fire pump drive shaft, a fire pump mounted on said gear box extending from said drive gear box front side and having an impeller in driven relationship to said fire pump drive shaft, a first power train shaft having a first end connected to said transmission output shaft and a second end connected to said gear box input shaft adapter, and a second power train shaft having a first end connected to said gear box output shaft adapter and a second end connected to said differential input shaft whereby said gear box shiftable power drive means selectively connects said engine and transmission to said differential or said fire pump.

4,811,805
REAR-WHEEL STEERING APPARATUS
Yasuhiko Yoshida, Anjo; Masahiro Honda, Aichi, and Shozo Takizawa, Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 30, 1986, Ser. No. 925,747
Claims priority, application Japan, Nov. 8, 1985, 60-250493
Int. Cl.[4] B62D *5/087*
U.S. Cl. 180—140 **13 Claims**



1. A rear-wheel steering apparatus for a vehicle, which includes front wheels and rear wheels, suspended on a vehicle body and adapted to be shifted by steering means, and a steering wheel, comprising:
a steering unit for steering the front wheels in response to a rotation of the steering wheel;
a hydraulic actuator for steering the rear wheels, said actuator including left and right hydraulic chambers, and a

drive member connected to the rear wheels and operating in response to a hydraulic pressure supplied to the hydraulic chambers; and

a directional control valve for supplying hydraulic pressure to the hydraulic actuator in response to the operation of the steering unit, said directional control valve including a cylindrical casing; a control valve body slidably arranged in the casing so that a relative displacement, corresponding to the steering direction and steering angle of the front wheels, is produced between the casing and the control valve body in response to the operation of the steering unit, said control valve body having three spools arranged at intervals; hydraulic fluid filled left and right pressure control chambers defined by the casing and the control valve body so that each of the pressure control chambers changes its capacity as the control valve body undergoes relative displacement; hydraulic fluid filled left and right pressure chambers defined between adjacent spools so as to communicate with the left and right pressure control chambers, respectively; a left in-phase port formed in the casing and communicating with the left hydraulic chamber; a right in-phase port formed in the casing and communicating with the right hydraulic chamber; a left antiphase port formed in the casing and communicating with the right hydraulic chamber; a right antiphase port formed in the casing and communicating with the left hydraulic chamber, a left communication passage formed in the spool located between the left pressure control chamber and the left pressure chamber to thereby connect them; and a right communication passage formed in the spool located between the right pressure control chamber and the right pressure chamber to thereby connect them;

wherein said left in-phase port is arranged so as to connect the left pressure chamber to the left hydraulic chamber to supply the hydraulic fluid in the left pressure chamber into the left hydraulic chamber, thereby steering the rear wheels in the same direction as the front wheels, when the control valve body is moved to reduce the capacity of the left pressure control chamber; said right in-phase port is arranged so as to connect the right pressure chamber to the right hydraulic chamber to supply the hydraulic fluid in the right pressure chamber into the right hydraulic chamber, thereby steering the rear wheels in the same direction as the front wheels, when the control valve body is moved to reduce the capacity of the right pressure control chamber; said left antiphase port is arranged so as to connect the left pressure chamber to the right hydraulic chamber to supply the hydraulic fluid in the left pressure chamber to the right hydraulic chamber, thereby steering the rear wheels in the direction opposite to the steering direction of the front wheel, when the control valve body is moved to reduce the capacity of the left pressure control chamber; said right antiphase port is arranged so as to connect the right pressure chamber to the left hydraulic chamber to supply the hydraulic fluid in the right pressure chamber to the left hydraulic chamber, thereby steering the rear wheels in the direction opposite to the steering direction of the front wheels, when the control valve body is moved to reduce the capacity of the right pressure control chamber; said control valve body being formed so as to close the left and right antiphase ports and open the left and right in-phase ports until the relative displacement of the control valve body reaches a predetermined amount, and to close the in-phase ports and to open the antiphase ports when the relative displacement of the control valve body exceeds the predetermined amount.

4,811,806

SERVOSTEERING, ESPECIALLY FOR MOTOR VEHICLES

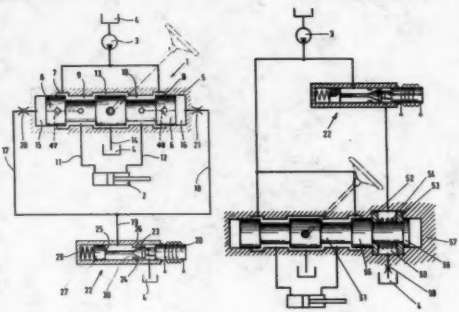
Armin Lang, Schwabisch Gmund, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

Filed Jul. 17, 1986, Ser. No. 886,379

Claims priority, application Luxembourg, Aug. 3, 1985, 00390

Int. Cl.[4] B62D *5/08*

U.S. Cl. 180—141 **9 Claims**



7. A servosteering system especially for motor vehicle comprising a servomotor **(2)**, a servopump **(3)**, a tank **(4)**, a steering control valve **(1, 51)**, reaction chamber means **(15, 16, 50)** connecting through fixed restrictor means **(20, 21, 58)**, and a control mechanism **(22)** comprising variable restrictor means controlling flow to said tank; characterized by said variable restrictor means having means **(23, 25, 26)** for decreasing flow to said tank with increasing servosteering pressure and additional means **(28)** independently operative on said variable restrictor means to decrease flow through said variable restrictor means with said decreasing speed.

4,811,807

METHOD AND APPARATUS FOR DAMPING STEERING MOVEMENTS

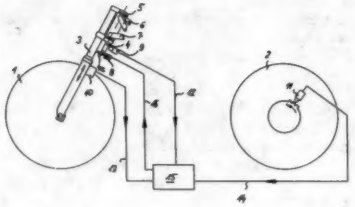
Guenther Schier, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 31, 1987, Ser. No. 91,025

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1986, 3629815

Int. Cl.[4] B62D *5/06*

U.S. Cl. 180—141 **18 Claims**



1. A method for damping the steering movements by means of a steering damper adjustable in its damping value, comprising the steps of feeding continuously measured steering angle value and driving velocity value to an electronic evaluation circuit, comparing the measured values with predetermined constant threshold values, and producing a signal for changing

the damping value of the steering damper when both measured values exceed their respective threshold values.

4,811,808

ACCELERATION SLIP CONTROL DEVICE FOR A WHEELED VEHICLE

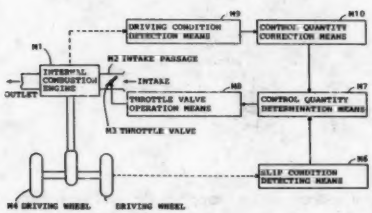
Shinichi Matsumoto; Kiyotaka Ise, both of Susono, and Hiroharu Miyazaki, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Oct. 16, 1987, Ser. No. 109,303

Claims priority, application Japan, Oct. 27, 1986, 61-254996

Int. Cl.[4] B60K *28/16*; F02D *29/02*

U.S. Cl. 180—197 **9 Claims**



1. A control system for preventing a slip comprising:

slip detection means for detecting a driving wheel speed and providing a first signal corresponding thereto and for determining whether or not said slip occurs based on said first signal;

engine intake air volume estimation means for estimating an intake air volume of an internal combustion engine and providing a second signal corresponding thereto;

desired engine output determination means, receiving said first and second signals when said slip occurs for determining a desired engine output in response to at least said first signal and modifying said desired engine output in response to said second signal; and

engine output control means responsive to said desired engine output determination means for controlling an engine output to approach said modified desired engine output.

4,811,809

TRACTION SLIP CONTROL DEVICE

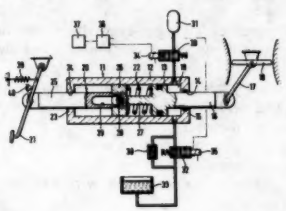
Hans D. Reinartz, Frankfurt am Main; Helmut Steffes, Hattersheim; Joachim Maas, Darmstadt, and Thomas Schwarz, Eschenburg, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 5, 1987, Ser. No. 58,423

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1986, 3619409; Jul. 11, 1986, 3623491

Int. Cl.[4] B60K *28/16*

U.S. Cl. 180—197 **2 Claims**



1. A traction slip control device for use with an automotive vehicle, said device comprising a sensor for detecting a beginning slip condition on at least one of the driving wheels of the vehicle and for issuing a slip signal when such condition is detected, an auxiliary drive for actuating the throttle valve of the vehicle drive engine in the closing sense and a control circuit responsive to said slip signal for operating said auxiliary drive, said auxiliary drive comprising a hydraulic control element having a hydraulic cylinder and a hydraulic piston slidable therein, a piston rod extending from a bore in an end wall of the cylinder and being coupled to an actuating linkage associated with the throttle valve, a cylinder chamber adjacent said piston for reserving hydraulic pressure which causes said piston rod to act on said actuating linkage to operate the throttle valve in the closing sense, a rod assembly located on the side of said piston opposite said piston rod and being operative by an accelerator pedal in the vehicle, a compensating spring between said piston and said rod assembly which permits movement of the piston under the influence of hydraulic pressure in said chamber for moving said piston and said piston rod toward said rod assembly and for moving said actuating linkage to close the throttle valve, wherein the rod assembly comprises an actuating rod which extends through a bore in an end wall of the cylinder opposite the piston rod for connection to the accelerator pedal in the vehicle, said actuating rod being slidable into the cylinder, the end of the actuating rod disposed inside the cylinder being connected via said compensating spring to said piston, a tension element arranged between the piston and the actuating rod and in parallel relation with said compensating spring for maintaining a predetermined bias of the compensating spring without inhibiting compression of the compensating spring; and

wherein a guiding piston is slidingly accommodated in the cylinder and is affixed to the end of the actuating rod inside the cylinder, said compensating spring extending between said hydraulic piston and said guiding piston.

4,811,810

FINAL DRIVE ASSEMBLY FOR THREE WHEELED VEHICLES

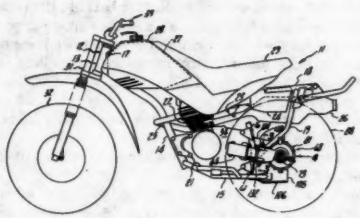
Hiromitsu Watanabe, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki, Shizuoka, Japan

Filed Oct. 21, 1983, Ser. No. 544,454

Claims priority, application Japan, Oct. 29, 1982, 57-190537

Int. Cl.[4] B62K *13/04*

U.S. Cl. 180—215 **32 Claims**



1. In a final drive arrangement for a wheeled vehicle comprising frame means, a single seat carried by said frame means, at least one front wheel carrying a balloon tire dirigibly supported by said frame means, a power plant supported by said frame means and having an output element journaled for rotation about an axis extending in a generally longitudinal direction by said frame means and fixed axially thereto, and a final drive assembly comprising a housing assembly, a rear axle assembly journaled in said housing assembly, a pair of rear wheels carrying balloon tires affixed to opposite sides of said rear axle assembly, and a final drive for driving said rear axle assembly comprising an input element journaled by said housing assembly about an axis extending in a generally longitudinal direction and positioned at one side of said final drive assembly and in alignment with said power plant output element axis, the improvement comprising said frame means

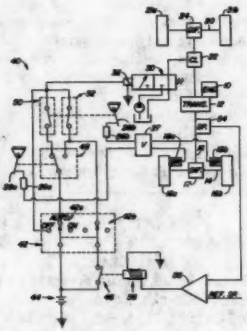
having a structural element defining a rearwardly opening recess, disengageable coupling means for drivingly coupling said input element with said output element for driving said rear axle assembly from said power plant, and means carried by said housing assembly for detachably affixing said housing assembly to said frame means structural element within said recess and with said coupling means in engagement, said recess and said frame means being configured to permit said final drive assembly including said input element to be rolled as a unit rearwardly from said recess, said output element and said frame means upon rear wheel balloon tires upon release of the means detachably affixing said housing assembly to said frame means and said coupling means.

4,811,811

BRAKE SYSTEM FOR FOUR-WHEEL DRIVE VEHICLES

Mark A. Bergene, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Feb. 16, 1988, Ser. No. 155,772
Int. Cl.[4] B60K *23/08*
U.S. Cl. 180—244 **8 Claims**



1. In a vehicle having a primary axle driven by an engine via a transmission, first and second drive wheels on the primary axle, first and second service brakes for braking the respective first and second drive wheels, a secondary axle supporting a pair of secondary wheels, a clutch between the engine and the secondary axle, a clutch control means for controlling engagement and disengagement of the clutch, the clutch control means comprising:

means for automatically engaging the clutch when both service brakes are applied;

means for engaging the clutch when both service brakes are released; and

means for automatically disengaging the clutch when only one of the first and second service brakes is applied.

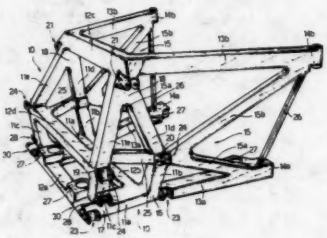
4,811,812

REAR FRAME FORMING PART OF A SUPPORTING STRUCTURE OF A MOTOR VEHICLE

Ferdinando Cassese, Modena, Italy, assignor to Ferrari Engineering S.p.A., Modena, Italy

Filed Jun. 16, 1988, Ser. No. 207,203
Claims priority, application Italy, Jun. 16, 1987, 67511 A/87
Int. Cl.[4] B60K *5/04*
U.S. Cl. 180—295 **7 Claims**

1. A rear frame forming part of a supporting structure of a motor vehicle and resiliently connected to a central frame (1) of the said structure, which is adapted to support the motor vehicle passenger compartment, the said rear frame being adapted to support the engine (2) and some of the members (3, 4) of the motor vehicle transmission and being resiliently connected to each rear wheel (5) of the motor vehicle via a resilient suspension, characterised by the fact that it includes a pair of first ring-shape structural elements (10) each of which is disposed substantially in a plane parallel to the direction of movement of the said motor vehicle and is adapted to support one of the said resilient suspensions and in turn comprises a plurality of limbs (11*a, b, c, d, e*) connected together at their ends in such a way as to form a closed polygonal lattice, a plurality of cross members (12*a, b, c, d*) orthogonal to the said



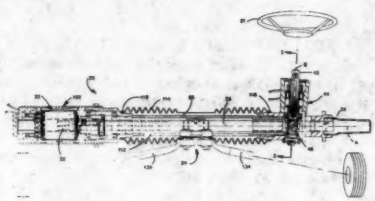
direction and connecting together the said ring-shape structural elements to form with them a single lattice structure; two pairs of longitudinal side members (13*a*, 13*b*) each of which has one end fixed to one of the said ring-shape structural elements and the other end (14*a*, 14*b*) adapted to be resiliently connected to the said central frame, one of the said longitudinal side members of each pair delimiting the top of one side of the said frame and the other longitudinal side member delimiting the bottom of the same side of the frame.

4,811,813

CENTER TAKE-OFF ELECTRIC RACK AND PINION STEERING GEAR

John A. Hovanchak, Utica, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Filed Feb. 17, 1987, Ser. No. 15,281
Int. Cl.[4] B62D *5/04*
U.S. Cl. 180—79.1 **15 Claims**



1. A steering gear for turning steerable vehicle wheels comprising:

an elongate member having a screw thread portion adjacent one end thereof and a rack portion adjacent the other end thereof;

linkage pivotally connected to said elongate member for turning the steerable vehicle wheels upon movement of said elongate member;

a rotatable pinion gear meshing with said rack portion of said elongate member;

an electric motor adjacent said screw thread portion of said elongate member;

a ball nut rotatable by said electric motor and cooperating with said screw thread portion to move said elongate member axially upon rotation of said ball nut; and

means intermediate said screw thread portion and said rack portion attaching said linkage to said elongate member to

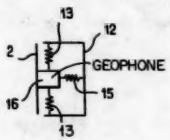
effect axial movement of said linkage upon axial movement of said elongate member.

4,811,814

MEASURING DEVICE FOR A SEISMIC PROFILE WITHIN A WELL-BORE

Philippe Staron, Meanecy, and Pierre Gros, Buc, both of France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France

Continuation of Ser. No. 666,840, Oct. 31, 1984, abandoned. This application Jan. 29, 1987, Ser. No. 9,586
Claims priority, application France, Nov. 9, 1983, 83 17788
The portion of the term of this patent subsequent to Aug. 11, 2004, has been disclaimed.
Int. Cl.[4] G01V 1/00, 1/40
U.S. Cl. 181—108 11 Claims



1. A measuring device for a seismic profile of the subsurface strata traversed by a well-bore comprising:

a transmission means placed at the ground surface and capable of delivering transmission signals having a frequency spectrum within the range of 5 to 500 Hz;

a tool body disposed within the well;

a conductor cable connecting said tool to said transmission means;

resilient means connected to said tool body and having an elasticity S, said resilient means comprising a spring means which is flexible in three predetermined directions, each direction being at an angle with respect to the other directions;

at least one geophone having a mass m mounted on said resilient means;

said geophone being adapted for receiving acoustic waves generated by said transmission signals after propagation within subsurface strata having an elasticity s and for delivering electrical signals in response to received acoustic waves;

recording and processing means disposed on the ground surface for recording and processing aid electrical signals and being connectable through said cable to said geophone;

said resilient means supporting said at least one geophone and being capable of vibrating in at least two of said directions at angles with respect to each other so as to substantially decouple said at least one geophone from said tool body; and

application means connected to said resilient means for displacing said geophone and resilient means for resiliently urging said geophone against a wall of the well-bore by said resilient means during each detection of said acoustic means;

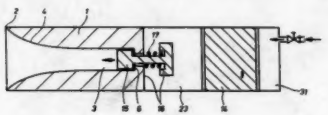
said mass m of said geophone and said elasticity S of said resilient means defining a first resonant frequency and said mass m of said geophone and said elasticity s of the subsurface strata defining a second resonant frequency, said first resonant frequency being at most equal to said second resonant frequency.

4,811,815

PROCESS AND A DEVICE FOR HYDRODYNAMIC SOUND PULSE GENERATION IN A LIQUID

Gerd Meier, and Andreas Laake, both of Göttingen, Fed. Rep. of Germany, assignors to 501 Max-Planck-Gesellschaft Zur Forderung der Wissenchaften E.V., Gottingen, Fed. Rep. of Germany

PCT No. PCT/DE86/00246, § 371 Date Feb. 27, 1987, § 102(e) Date Feb. 27, 1987, PCT Pub. No. WO87/00296, PCT Pub. Date Jan. 15, 1987
PCT Filed Jun. 12, 1986, Ser. No. 29,758
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1985, 3523324
Int. Cl.[4] H04R 1/02
U.S. Cl. 181—120 7 Claims



1. A device for hydrodynamic sound pulse generation in a liquid comprising:

a housing means including first and second oppositely disposed pipe means, each open at one end, the open ends being oppositely disposed, and surrounding a respective column of said liquid of a selected length each said pipe means (1) being in the shape of a bell (4) at its oppositely disposed open end;

a tow link for a towing cable;

a means for generating a compressive force for striking, in bursts and with force, the end of the liquid column opposite the open end (2) of each pipe means in the direction of its axis in order to cause sudden deceleration of the liquid column, in such a way that a sound pressure pulse is generated and transmitted in the liquid column to the open end (2) of the pipe means and from there is radiated as a sound pulse into the liquid, and is reflected as a rarefaction wave into the liquid column;

said means for generating comprising:

a piston means slidably mounted within said housing means for providing a first driving surface within said first pipe means and a second driving surface within said second pipe means, said piston means and respective driving surfaces being slidable into and out of the respective pipe means;

stop means for stopping motion of said piston means at a selected distance into either said first or second pipe means; and

means attached to said tow link and said housing means for rotating said housing means by at least 180 degrees with respect to said tow link, thereby activating said position means.

4,811,816

SYMMETRIC DOUBLE PHONIC DIAPHRAGM VOLUME-ENHANCING DEVICE

Tse-Hung Lin, No. 2, Lane 126, Pu Ting Road, Hsinchu City, Taiwan

Filed Apr. 22, 1988, Ser. No. 184,817
Int. Cl.[4] G10K 9/12
U.S. Cl. 181—160 1 Claim

1. A symmetric two-diaphragm sound-enhancing device comprising:

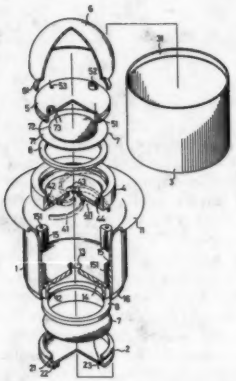
a lower cavity base in a basin-shaped body having a bottom cover from which a funnel-type opening extends upwardly and also having a tenon provided downward on a perimeter thereof, a protruding ring formed on an inner perimeter, four equally-spaced convex platforms provided on the bottom cover in the inner perimeter of the funnel-

type opening, a hole provided in each of the four convex platforms, a sound outlet provided at a center of the bottom cover and a concave annular groove provided at a proper place on said bottom cover;

an upper cavity base provided with four spiral ribs on a lower side thereof, having a sound outlet formed at a center of the cavity base, a protruding ring on a perimeter thereof extending downward and an annular groove provided at a proper place on an inside perimeter thereof;

two cover bodies each of which is in a round plate body and has a concave ring on a perimeter thereof extending upwardly, and a hole and convex ribs provided at proper places thereon;

a base body having an annular body extending upwardly, a connection tenon provided on an end of said annular body;



an arcuate body in an arcuate surfaced shell body having four equally spaced convex pieces provided on a perimeter thereof;

said concave rings of the two cover bodies being engaged with respective convex rings on the upper and lower cavity bases to form upper and lower resonance sound cavities respectively, an annular pad and a piezo-electric-type diaphragm are provided in each of the sound cavities respectively; the tenon of the lower cavity base being joined to the connection tenon on the base body of the lower cavity base, the upper cavity base being joined with the arcuate body to make the arcuate body and a top of the lower cavity base form an opening piezo-electric-type diaphragm so that conductive wires go through holes provided therefor and spaces of the arcuate convex pieces and said spiral ribs are joined to the bottom cover of the lower cavity base.

4,811,817

SELF-CONTAINED LADDER SYSTEM FOR A BOAT

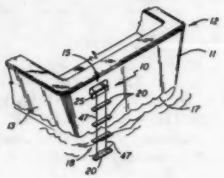
Timothy C. Geary, 2201 Hemerick Pl., Clearwater, Fla. 34625

Filed May 17, 1988, Ser. No. 194,946

Int. Cl.[4] B63B *27/14*

U.S. Cl. 182—76 **9 Claims**

1. A hidden ladder apparatus that includes a housing horizontally disposed in the transom of a boat hull above the waterline, said housing having a front wall containing an opening formed therein in coplanar alignment with said transom and a solid back wall position inside said boat hull, a foldable ladder secured to the back wall of the housing which, when folded, is fully stowed within said housing and, when extended, hangs from the housing to or below the water line, and a door for



closing the opening in said housing when the ladder is stowed within said housing.

4,811,818

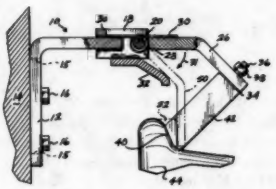
TRANSIT RAIL LUBRICANT APPLICATOR

Warren E. Jamison, Edmonds, Wash., assignor to Durafilm Corporation, Seattle, Wash.

Filed Aug. 19, 1987, Ser. No. 86,912

Int. Cl.[4] F16N *15/00*

U.S. Cl. 184—3.2 **15 Claims**



1. A lubricant applicator comprising:

(a) a fixed bracket adapted to attach to an undercarriage of a rail car;

(b) a lubricant support arm, pivotally connected to the fixed bracket and adapted to mount a block of solid lubricant on a surface of the lubricant support arm at a point spaced apart from the pivotal connection; and

(c) spring means for biasing the lubricant support arm so that it and the block of solid lubricant mounted thereon swing through an arc, bringing the block of solid lubricant into contact with a rail car wheel flange.

4,811,819

DEVICE FOR HORIZONTALLY MOVING AN APPARATUS WORKING AT A HIGH LOCATION

Yutaka Sugiyama, Tokyo, Japan, assignor to Nihon Biso Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 29, 1988, Ser. No. 162,174

Claims priority, application Japan, Mar. 9, 1987, 62-53484

Int. Cl.[4] E04G *3/10, 3/14*

U.S. Cl. 182—37 **10 Claims**

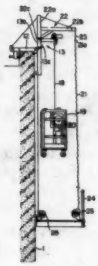
1. A device for horizontally moving an apparatus working at a high location comprising:

a mounting frame fixedly provided on the upper end portion of a structure and having a vertically extending rotary shaft receiving portion at the foremost end portion thereof;

a rail supporting member having a rotary shaft received rotatably in the rotary shaft receiving portion of the mounting frame and also having an arm extending substantially normally from said rotary shaft and including a rail supporting portion at the foremost end portion thereof;

a horizontally extending rail disposed detachably on said rail supporting portion of said rail supporting member;

rail pivoting means associated with said rail supporting portion and said rail for pivoting said rail when said rotary shaft of said rail supporting member is rotated; and



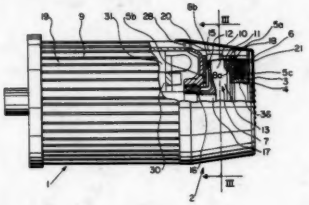
a trolley mounted on said horizontally extending rail for suspending the apparatus working at a high location.

4,811,820

DISK BRAKE MOTOR

Hannu Rossi, Iittala, Finland, assignor to Kone Oy, Hyvinkaa, Finland

Filed Sep. 21, 1987, Ser. No. 98,796
Claims priority, application Finland, Jan. 12, 1986, 864896
Int. Cl.[4] F16D *55/02*
U.S. Cl. 188—71.6 **5 Claims**



1. A disk brake motor comprising:

an electric motor having a rotatable shaft extending axially therethrough;

a housing about said motor;

means defining at least one friction surface;

a brake wheel on said shaft for rotation therewith, said brake wheel being in contact with said friction surface during braking; and

an electromagnet actuatable to control said contact between said at least one friction surface and said brake wheel;

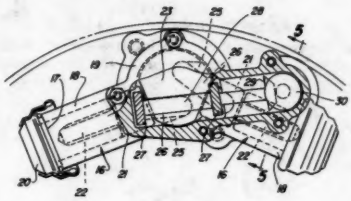
said brake wheel including means for drawing in and impelling air so that the air flows around and through said electromagnet, into and then through said brake wheel, past said friction surface and onto a surface of said housing, said brake wheel including a pair of axially spaced flanges, at least one of which has at least one opening therein for drawing in air, and partition means disposed therebetween and cooperating with said flanges to form a centrifugal impeller.

4,811,821

COMPACT DRUM BRAKE ADJUSTER

Nigel C. Wrench, Gwent, Wales, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Sep. 11, 1987, Ser. No. 96,594
Int. Cl.[4] F16D *51/00, 65/56*
U.S. Cl. 188—79.62 **24 Claims**



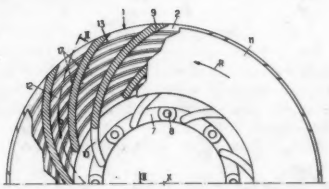
1. In a drum brake actuator comprised of a pair of tappet assemblies slidably supported relative to respective brake shoe ends for actuating the brake shoes into frictional engagement with an associated brake drum for braking the rotation of the brake drum, actuating means for moving said tappets in a direction to apply the brake shoes, each of said tappets comprising first and second screw-threaded components operable upon relative rotation to effect a change in the length of said tappets to compensate for wear, and means for interconnecting the second components of said tappets for simultaneous rotation including a shaft rotatable about an axis extending transversely to the axis of the associated brake drum, the improvement comprising automatic adjusting means spaced from said tappets and from said interconnecting means for effecting adjustment of said tappets by controlling the rotation of said shaft, said automatic adjusting means being operable about an axis extending transversely to said shaft axis.

4,811,822

ARMATURE ROTORS OF ELECTROMAGNETIC BRAKES

Michel Estaque, Taverny, France, assignor to Labavia S.G.E., Montigny le Bretonneux, France

Filed Feb. 17, 1987, Ser. No. 15,297
Claims priority, application France, Feb. 21, 1986, 86 02425
Int. Cl.[4] B60L *7/28;* F16D *65/78*
U.S. Cl. 188—264 A **6 Claims**



1. Armature rotor for an electromagnetic brake that includes a stator, the rotor comprising at least one disc axially mountable spaced from the stator and connected to an inner fastening ring by a ring of arms, said arms being inclined to the corresponding radii so as to form ventilation fins, the disc having a first surface adjacent the stator and a substantially flat, second surface furthest therefrom, the portions of largest diameter of these arms projecting axially on the disc and their crests being joined together by an annular web, this web, the disc and those portions of the fins which connect the web and disc defining channels for ventilation air, characterized in that said second

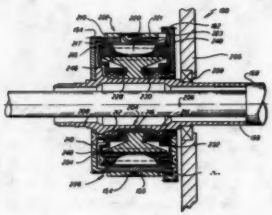
disc surface is striated or undulated by annular and concentric ribs extending in a direction inclined to the direction of flow of the air in these channels, the angle formed between side of a rib and the portion of the contiguous surface being at the most equal to 90°, and the ratio between the spacing (D) of successive ribs and the height (H) of these ribs being comprised between 5 and 15.

4,811,823

MAGNETIC PARTICLE CLUTCH

Bruce C. Raymond, Pittsboro, and Richard A. Fink, Rougemont, both of N.C., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 27, 1987, Ser. No. 125,892
Int. Cl.[4] F16D *37/02*
U.S. Cl. 192—21.5 **3 Claims**



1. A magnetic particle clutch for use as a clutch or a brake comprising:

an outer drum having an axis;

an inner rotor coaxial with the outer drum;

said inner rotor having a shaft along the axis and having a first end wall fixedly connected to the shaft and having of axially spaced bearings journaled on the shaft and having a rotor cylinder fixedly connected to the shaft and disposed axially between the pair of axially spaced bearings;

said outer drum having a housing mounted on the axially spaced bearings and having a second end wall fixedly connected to the housing and having a coil unit supported within the housing and having slip rings mounted on a radially exterior surface of the housing with conductors connecting to the coil unit;

said rotor cylinder having a radially outer surface and said housing having a radially inner surface;

a cylindrical working cavity disposed between the rotor cylinder radially outer surface and the housing radially inner surface;

a magnetic powder disposed within the cylindrical working cavity;

said cylindrical working cavity having a first set of cavities forming a first powder guide at a first end thereof and having a second set of cavities forming an identical, opposite hand, second powder guide at a second, opposite end thereof, wherein said first set of cavities forming the first powder guide includes:

a first conical cavity connecting to the cylindrical working cavity;

a radial cavity connecting to the first conical cavity; and

a second conical cavity connecting to the radial cavity.

4,811,824

HUB CLUTCH

Sakuo Kurihara, Tochigi, Japan, assignor to Tochigi-Fuji Sangyo Kabushiki Kaisha, Tochigi, Japan

Filed Aug. 11, 1987, Ser. No. 84,082
Claims priority, application Japan, Aug. 11, 1986, 61-188295; Oct. 2, 1986, 61-151749[U]; Feb. 4, 1987, 62-15127[U]
Int. Cl.[4] F16D *11/00, 43/00*
U.S. Cl. 192—35 **7 Claims**

1. A hub clutch for selectively transmitting torque between an axle shaft extending in an axial direction and a wheel hub, said hub clutch comprising:

a cylindrical casing fixed to the wheel hub,

said cylindrical casing having an inner peripheral surface, an outer end, a spline extending along said inner peripheral surface, and an opening extending through said outer end;

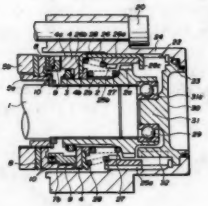
a knob rotatably mounted to said casing in the opening extending therethrough, said knob having a boss portion extending within said casing, said boss portion defining a cam surface having an axial inner portion and an axial outer portion, said cam surface inclined from the axial inner portion to the axial outer portion thereof;

a drive gear secured to the axle shaft at an end thereof,

said drive gear having both a gear portion and a spline extending on the outer periphery thereof, and a stepped portion;

a cam member in splined engagement with the spline of said drive gear so as to be movable along said drive gear in the axial direction, said cam member having a cam portion projecting toward an inner side of the hub clutch;

an outer brake means adjacent said cam member, said outer brake means having a grooved cam portion engageable with the cam portion of said cam member;



a stationary system connected to said outer brake for preventing said outer brake means from rotating;

an inner brake disposed within said outer brake means,

said inner brake having a grooved first cam portion engageable with the cam portion of said cam member, and second cam portions each of which is disposed at a respective one of opposite sides of said grooved first cam portion;

a clutch ring in splined engagement with the spline of said cylindrical casing so as to be movable along said inner casing in the axial direction, said clutch ring movable to a clutching position at which said clutch ring engages the gear portion of said drive gear;

a return spring extending between said cam member and the stepped portion of said drive gear and urging said cam member toward the inner side of the hub clutch in the axial direction;

a retainer slidably mounted in the hub clutch and contacting said cam member, said retainer having a pawl portion engageable with the cam surface of said knob; and

a shift spring extending between said clutch ring and said retainer.

4,811,825

DOG CLUTCH WITH LOCKING SYNCHRONIZATION

Klaus Christian, Immenstaad, and Führer Gerd, Friedrichshafen, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/EP86/00422, § 371 Date Feb. 27, 1987, § 102(e) Date Feb. 27, 1987, PCT Pub. No. WO87/00595, PCT Pub. Date Jan. 29, 1987

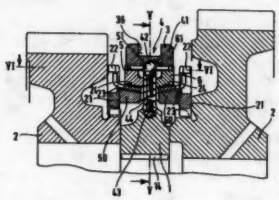
PCT Filed Jul. 17, 1986, Ser. No. 26,580

Claims priority, application PCT Int'l Appl., Jul. 26, 1985, PCT/EP85/00376

Int. Cl.[4] F16D *23/04*

U.S. Cl. 192—53 F

4 Claims



1. An apparatus consisting of a dog clutch and a locking synchronization device, said apparatus comprising:

an externally toothed synchronizer body rotatable about an axis;

a gear rotatable about said axis relative to said synchronizer body and alongside said synchronizer body;

a shifting ring having internal teeth engaged with the external teeth of said synchronizer body and rotatably entrained therewith while being axially shiftable relative to said body;

at least one radially biased pin mounted in said body, engageable in a recess formed internally of said shifting ring, and having a lateral pressure surface;

an outer synchro ring surrounded by said shifting ring and provided with blocking teeth engageable with said internal teeth of said shifting ring upon angular offset of said outer synchro ring and said shifting ring for blocking axial displacement of said shifting ring beyond a limited axial shift, said outer synchro ring being engaged by said lateral pressure surface upon said limited axial shift of said shifting ring;

an externally toothed element connected with said gear and adapted to receive said internal teeth to couple said gear with said shifting ring upon release of said internal teeth by said blocking teeth;

an inner synchro ring surrounded by said outer synchro ring;

a friction member rotationally coupled with said element and interposed between said synchro rings and frictionally engageable therewith upon said limited axial displacement of said shifting ring to synchronize the rotation of said gear with that of said synchro rings and said body; and

a coupling element interconnecting said inner and outer synchro rings, received with limited circumferential play in a further recess formed in said body, enabling axial displacement of said synchro rings relative to said body, and rotationally coupling said synchro rings with said body.

4,811,826

FRICTION CLUTCH WITH INTERLOCKING FLYWHEEL AND CLUTCH COVER

Friedrich Kittel, Schweinfurt, and Dieter Kolb, Bad Kissingen, both of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

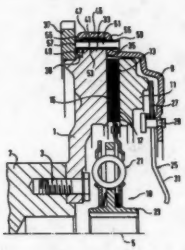
Filed Jul. 28, 1987, Ser. No. 78,918

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1986, 3626118

Int. Cl.[4] F16D *13/50, 13/58*

U.S. Cl. 192—70.13

14 Claims



1. A friction clutch, especially for a motor vehicle, comprising

a flywheel rotatable about a rotation axis,

a clutch cover secured removably on the flywheel,

a presser plate arranged in the clutch cover and nonrotatably but axially movable in relation to the flywheel,

a clutch friction disc arranged axially between the flywheel and the presser plate,

a clutch main spring braced in between the clutch cover and the urging plate and pressing the presser plate and the clutch friction disc toward the flywheel, said flywheel comprising several apertures spaced radially outwardly from and extending continuously through said flywheel in the axial direction of the rotation axis and being offset in relation to one another in the circumferential direction, in the region of the flywheel's external circumference, and an axially spaced abutment face between each aperture in the circumferential direction on a side of said flywheel axially remote from the presser plate,

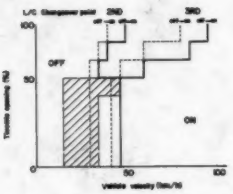
said clutch cover comprising on the radially outer circumferential margin thereof adjacent to the flywheel, tabs corresponding to the apertures of the flywheel and protruding in part transversely of the direction of the rotation axis, said tabs having sides extending transversely of the axial direction of the rotation axis and facing toward and comprising counter-abutment faces intended to abut on the abutment faces of the flywheel, wheel in such manner that the clutch cover can be fitted axially on to the flywheel with the tabs passing in the direction of the rotation axis through the apertures and can be locked in a locking position axially on the flywheel by a rotation relative to the flywheel about the rotation axis,

and said flywheel and said clutch cover comprising at least one pair of openings aligned with one another in the locking position, into which a rotation-securing element is releasably inserted.

4,811,827
LOCK-UP CLUTCH CONTROL METHOD IN AUTOMATIC TRANSMISSIONS FOR AUTOMOTIVE VEHICLES

Kazuo Ishikawa, and Yoshinori Nishi, both of Aichi, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 14, 1987, Ser. No. 73,092
Claims priority, application Japan, Jul. 15, 1986, 61-164767
Int. Cl.[4] B60K *41/02*
U.S. Cl. 192—0.076 6 Claims



1. A method of controlling a lock-up clutch in an automatic transmission of an automotive vehicle wherein the transmission comprises the lock-up clutch, a fluidic torque converter and a gear change mechanism, and an electronic control unit therefor, the method comprising the steps of:

controlling, by the electronic control unit, changeover of the lock-up clutch by setting at least one changeover line turning the lock-up clutch from OFF to ON in a changeover diagram in which vehicle velocity and throttle opening are plotted along respective coordinate axes; and

controlling, by the electronic control unit, changeover of transmission gear ranges by setting a transmission gear range changeover point in a gear shift diagram having coordinates axes identical with those of the changeover diagram; and

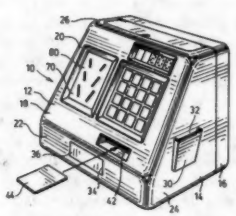
the method further comprising:

setting the OFF to ON changeover line in such a manner that it will not intersect a region in the gear shift diagram where the shift position is at least 3rd gear range or less and the throttle opening is less than a predetermined value.

4,811,828
SAVINGS BANK

Linda Gotman, and Nickolas K. Gotman, both of 2056 Barsuda Drive, Unit #30, Mississauga, Ontario L5J 1V8, Canada

Filed Apr. 16, 1987, Ser. No. 39,024
Int. Cl.[4] A45C *1/12*
U.S. Cl. 194—351 5 Claims



1. A child's savings bank comprising;

(a) a housing having a coin storage chamber formed therein,

(b) a plurality of coin slots opening through a front wall of said housing for admitting coins to said chamber,

(c) a plurality of coin barriers, one associated with each coin slot,

(d) activator means for moving each barrier between a first position in which it is arranged to close its associated slot and a second position in which its associated slot is open,

(e) input signal control means having a plurality of manually operable input switches which are selectively operable to establish communications between the control means and any one of said activators, said input switches being located on said housing at a point remote from said coin slots and requiring the exercise of selection skill on the part of the operator to select the switch or switches which must be manipulated in order to control the operation of the activator which must be activated to open a coin slot through which a particular coin may be admitted to the coin storage chamber,

(f) a keyboard mounted on a wall of the housing such that its keys are accessible to a user, said keys serving to operate said input switches,

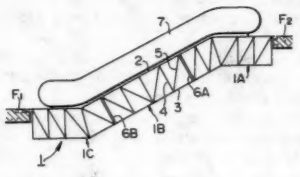
(g) a display panel mounted on a wall of the housing such that it is visible to a user,

(h) computer means for receiving a signal from the keyboard which is indicative of the monetary value keyed into the keyboard by a user which is an indication of the value of the coinage to be admitted through one of said coin slots and serving to generate an output signal to activate the activator means of the coin slot which is adapted to admit the coinage corresponding in value to the monetary value keyed into the keyboard to move its associated barrier to its second position.

4,811,829
FRAME OF PASSENGER CONVEYOR

Hayashi Nakazawa; Hiroumi Iyoda, both of Katsuta, and Makoto Ueta, Mito, all of Japan, assignors to Hitachi Ltd . and Hitachi Elevator Engineering Co., both of Tokyo, Japan

Filed May 7, 1987, Ser. No. 46,734
Claims priority, application Japan, May 10, 1986, 61-106978
Int. Cl.[4] B65G *21/02*
U.S. Cl. 198—326 8 Claims



1. A main frame of a passenger conveyor extending between floors of a building and having a cross-section defined by opposite side structures and connecting members interconnecting said side structures, each of said side structures including a plurality of frame sections divided along the length thereof and having joint portions at which said sections are connected together, each frame section including upper and lower frame members, wherein

the joint portions of each adjacent pair of frame sections include substantially parallel joint members respectively extending substantially transversly of the length of the side structure and having upper and lower end portions connected together by bolts and nuts, and one of said joint members is provided therein intermediate the nuts and bolts connecting said end portions with a positioning hole and the other joint member has affixed thereon a positioning pin previously located so as to be opposed to and engaged with said positioning hole and secured to said other joint member between the parallel joint members.

4,811,830

SORTING INSTALLATION FOR PIECE GOODS

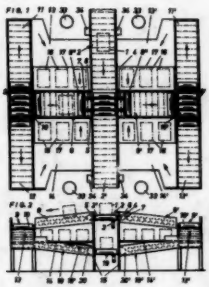
Christian Felder, Dreieichenhain, Fed. Rep. of Germany, assignor to Gebhardt Fördertechnik GmbH, Sinsheim, Fed. Rep. of Germany

Filed Apr. 27, 1983, Ser. No. 489,013

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1982, 3215744

Int. Cl.[4] B65G *37/00*

U.S. Cl. 198—372 **11 Claims**



1. A sorting installation for piece goods comprising a feeding main conveyor means, at least two sorting stations and a delivery conveyor means which are connected with each other by intermediate track means to enable movement of said piece goods from said main conveyor means all the way to any one of the at least two sorting stations on a first portion of as well as one of two second portions of said intermediate track means, which second portion extends substantially parallel to the main conveyor means, and then from said sorting stations onto a common third portion of the intermediate track means to the delivery conveyor means, all portions of the intermediate track means being constructed as gravity-roller-tracks, and at least one distributor means in said intermediate track means between said first portion and the two second portions which is constructed as gravity-roller-track and operable to be inclined in the transporting direction toward either of the at least two sorting stations to direct goods form the first portion of the intermediate track means to one of the at least two second portions of the intermediate track which lead to one of the at least two sorting stations and is arranged between the main conveyor means and the sorting station.

4,811,831

METHOD AND APPARATUS FOR POSITIONING ARTICLES

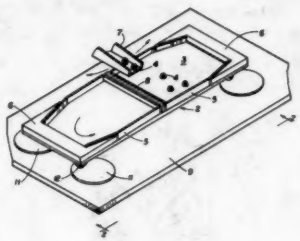
Glenn A. Honkomp, Warren, and Larry G. Burrows, Hamilton, both of Ohio, assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 12, 1985, Ser. No. 743,988

Int. Cl.[4] B65G *47/24*

U.S. Cl. 198—394 **11 Claims**

1. A method of positioning an article having opposed ends at least one of which is flat and an irregular surfaced body portion between the ends so that the article can stably rest on the flat end comprising: feeding the article in random orientation to a support surface disposed in a substantially horizontal plane; moving said support surface with the article disposed thereon alternatively in a back-and-forth direction; and, simultaneously moving said support surface with the article disposed thereon in the same plane of movement alternatively in a side-to-side direction so that the resulting forces created by such simultaneous motion of said support surface cause the article to seek a



stable position to rest in oriented position on the flat end of the article.

4,811,832

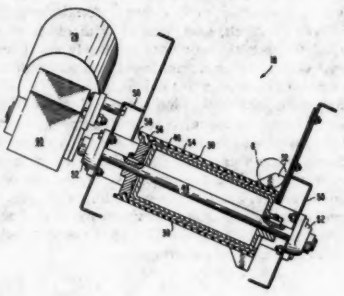
APPARATUS FOR OBTAINING A RANDOM SAMPLE

Gary O. Niemann, 3204 E. Lake Hartridge Dr., N.W., Winter Haven, Fla. 33880

Division of Ser. No. 594,379, Mar. 28, 1984, Pat. No. 4,541,290. This application Sep. 17, 1985, Ser. No. 776,995

Int. Cl.[4] B65G *47/12*

U.S. Cl. 198—443 **1 Claim**



1. Apparatus for feeding a plurality of objects one at a time comprising a surface having a plurality of movable cleats mounted on said surface along on edge thereof and a wall adjacent said one edge and stationary with respect to said cleats,

said surface being mounted such that said cleats move in a first direction which is upwardly inclined with respect to a horizontal direction and said surface is tilted about said first direction so that said one edge is lower than an opposed edge,

each of said cleats extending only partially across said surface and having a width and height adequate normally to engage only a single of said objects and small enough to reject objects other than said single of said objects, each of said cleats being adjacent said one edge and spaced from an opposed edge,

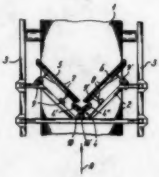
whereby each of said cleats engages a single of said objects, rejects all of a plurality of objects except said single object, and carries said single of said objects by movement of said cleats in said first direction.

4,811,833

WIPER APPARATUS FOR CONVEYOR BELT

Dick Slikker, Ede, Netherlands, assignor to HCC-EDE B.V., Ede, Netherlands

Filed Jun. 12, 1987, Ser. No. 60,853
Claims priority, application Netherlands, Dec. 5, 1986, 8603104
Int. Cl.[4] B65G 45/00
U.S. Cl. 198—499 2 Claims



1. In a conveyor belt system comprising an endless belt guided around at least two guide rollers being disposed at a distance from one another, one of said guide rollers being disposed at the feed end and the other of said rollers at the discharge end of the conveyor belt, and one of said rollers being adapted to be driven rotationally so that said endless belt includes an upper carrying run moving in a determined direction and a lower run moving substantially parallel thereto but in an opposite direction, said system including a conveyor belt stripper comprising:

at least one stripper device having a frame and a plurality of stripper elements, each element having an upstream edge relative to said determined direction of movement and a downstream free edge, said elements being mounted to said frame so that said stripper elements bear their free edges against an upper face non-material carrying run of said conveyor belt, said stripper elements forming a V-shaped stripper element with relatively short legs positioned with its tip upstream in relation to the direction of movement of said run of the belt,

said stripper device further including a plurality of elongate stripper elements mounted to said frame so as to define extensions of said legs of said V-shaped stripper element and are in each case placed further inward and downstream in relation to the respective leg of said V-shaped element and in relation to preceding elongate stripper elements positioned along said conveyor so that neighboring ends of said legs of the V-shaped element and of said the elongate elements overlap.

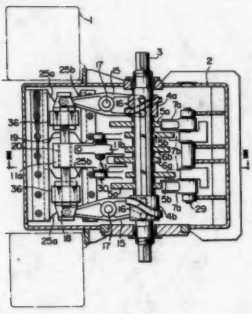
4,811,834

MECHANICAL TRANSFER FEEDER

Koji Asano, and Masao Okawa, both of Niihama, Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Jul. 23, 1987, Ser. No. 76,820
Claims priority, application Japan, Aug. 8, 1986, 61-186294
Int. Cl.[4] B65G 25/00
U.S. Cl. 198—621 2 Claims

1. A mechanical transfer feeder comprising a pair of substantially parallel feed bars, at least one pair of opposed jaws, one of said pair of opposed jaws being provided on each feed bar of said pair of feed bars, a mechanism incorporated in a feeder box disposed above said bars for moving said bars in three directions, each direction being substantially perpendicular to the other two directions, for effecting cyclic movement of said bars such that each pair of said opposed jaws act to clamp, lift, advance, lower and unclamp an article and return to the original position, thereby successively transferring articles from a first position to a second position, said mechanism including a cam shaft rotatably supported in said feeder box and carrying a pair of first cams, a pair of second cams and a pair of third cams, a pair of first cam leavers each having at its one end a cam follower cooperating with one of said first cams and said first cam levers carrying at their other end a rod in parallel with said cam shaft, a pair of bearing members fitted around the opposite ends of said rod and movable axially of said rod, a pair of lift guides, one of said pair of lift guides being connected at its upper end to one bearing member of said pair of bearing members and the other of said pair of lift guides being connected at its upper end to the other bearing member of said pair of bearing members, each lift guide of said pair of lift guides carrying at its lower end bearing means for slidably supporting one feed bar of a pair of feed bars, a pair of lift guide



carriers each slidably supported in said feeder box to move in a direction parallel with said cam shaft each lift guide carrier of said pair of lift guide carriers supporting one lift guide of said pair of lift guides for vertically slidable movement of said lift guide in said lift guide carriers, a pair of second cam levers each operating one lift guide carrier of said pair of lift guide carriers in response to operation of the second cam, a pair of third cam levers each having at its one end a cam follower cooperating with one third cam of said pair of third cams and being connected at its other end to one feed bar of said pair of feed bars through a link.

4,811,835

VIBRATORY MATERIAL FEEDER

Kenneth W. Bullivant, Chadds Ford, Pa., Ronald V. Ostenbridge, Franklinville, Thomas E. Leonix, Cape May Court, both of N.J., assignor to K-Tron International, Inc., Pitman, N.J.

Continuation of Ser. No. 916,413, Oct. 7, 1986, abandoned. This application Jul. 28, 1988, Ser. No. 225,593
Int. Cl.[4] B65G 27/32
U.S. Cl. 198—762 15 Claims

1. A vibratory material feeder comprising:

electromechanical vibratory actuator means for feeding material;

drive means for applying a substantially sinusoidal electrical drive wave form to said actuator means;

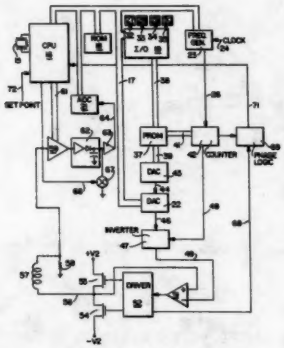
means for detecting a phase difference between a voltage and a current applied to said actuator means;

means, responsive to said phase difference, for controlling said drive means to minimize said phase difference whereby said actuator means is driven substantially in mechanical resonance;

means for detecting electrical power applied to said actuator means, and

means, responsive to detected electrical power, for controlling said drive means to apply electrical power to said actuator means to feed material at a desired rate, said means responsive to said detected electrical power including, means for storing a representation of at least a portion

of at least one substantially sinusoidal wave form, means for recalling said representation, and means for adjusting



an amplitude of said representation according to said detected electrical power.

4,811,836

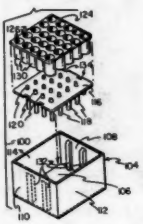
ADAPTABLE CARTRIDGE CONTAINER

William J. Minneman, Clayton, Ohio, assignor to MTM Molded Products Company, Dayton, Ohio

Filed May 6, 1988, Ser. No. 190,842

Int. Cl.[4] F42B *37/00, 39/00*

U.S. Cl. 206—3 **11 Claims**



1. An adaptable cartridge container for receiving a plurality of cartridges of one of a plurality of calibers comprising:

a housing having a floor and surrounding sidewall;

a cartridge support shelf sized to be received within said container adjacent said floor and including elevation control means for supporting said shelf at one of at least two heights above said floor; and

at least two ammunition trays each sized to be received within said housing and including a plurality of apertures for defining a apertured top surface for said housing, said container being adapted to receive a wide variety of cartridge calibers by inserting said cartridge support shelf into said housing such that it is supported at a selected height above said floor followed by insertion of one of said ammunition trays, the selection of the height of said cartridge support shelf and the ammunition tray being made to accommodate the caliber of cartridges to be received within the container.

4,811,837

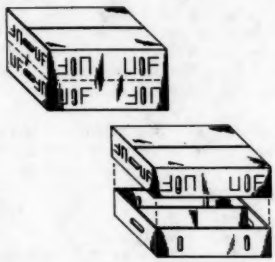
PRODUCE SHIPMENT AND SEPARABLE DISTRIBUTION AND DISPLAY CARTON

Edward P. Larizza, Chapaqua, N.Y., assignor to United Brands Company, Cincianati, Ohio

Filed Mar. 25, 1987, Ser. No. 30,218

Int. Cl.[4] B65D *17/00*

U.S. Cl. 206—45.11 **4 Claims**



1. A carton system for transport, distribution and point-of-sale display of produce, comprising:

a regular, corrugated carton having an upper horizontal panel, a lower horizontal panel, and sidewall panels extending between said upper and lower horizontal panels, and

a pair of corrugated, open trays adapted for transport and display of loose produce, and sized and constructed to rest within said carton in stacked array,

said carton adapted for separation along a plane generally corresponding to the plane of intersection of the stacked trays therewithin into a pair of carton segments,

each said carton segment sized and constructed to fit snugly over a produce tray, with the horizontal panel of said carton segment disposed over said produce in said tray, and segments of the sidewall panels of said carton segment disposed closely about side surfaces of said tray to form a distribution package of a single produce-containing tray protected by a carton segment,

each said produce tray sized and constructed to fit snugly within a said carton segment with the horizontal panel of said carton segment disposed beneath said produce tray, and segments of the sidewall panels of said carton segment disposed closely about side surfaces of said tray to form a display package of a single produce-containing tray, with the produce exposed for display, within a carton segment, each said produce tray of said carton system having a corresponding said carton segment having a horizontal panel, and

the segments of the sidewall panels of each said carton segment bearing pairs of markings,

a first marking of each said pair of markings displayed in orientation for reading when said carton segment and tray are assembled for produce distribution, and

a second marking of each said pair of markings displayed in orientation for reading when said carton segment and tray are assembled for produce display.

2. A method for transport, distribution and Point-of-sale display of produce, comprising the steps of:

packing produce in open produce trays,

stacking first and second trays of packed produce in a regular, corrugated carton having an upper horizontal panel, a lower horizontal panel, and sidewall panels extending between said horizontal panels, said cartons sized and constructed to snugly receive said first and second trays therewithin,

closing said carton and shipping said carton containing the produce to a distribution site,

separating the carton into upper and lower carton segments along a plane generally corresponding to the plane of intersection of the trays stacked within the carton, separation of the carton segments and associated trays creating a first distribution package of the first produce tray within said upper carton segment, the horizontal panel of the segment disposed over the produce in the tray and segments of the sidewall panels disposed closely about side surfaces of the tray,

removing the second produce tray from the lower carton segment, inverting said lower carton segment and covering a second produce tray with said lower carton segment to create a second distribution package,

transporting a said distribution package to a produce retail site, and

removing said carton segment from said produce tray, inverting said carton segment, and placing a produce tray therewithin to create a point-of-sale produce display.

4,811,838

PLATE-LIKE CONTAINER FOR CONTAINING JELLIED TWO PARTS COMPONENTS

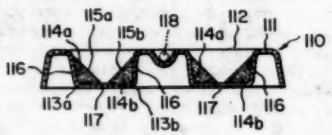
Ikuzo Usami; Yoshinori Sato; Yoshitaka Kurosawa, and Kazuyuki Morimura, all of Hachioji, Japan, assignors to Three Bond Co., Ltd., Tokyo, Japan

Division of Ser. No. 36,238, Apr. 9, 1987. This application Jul. 15, 1988, Ser. No. 219,315

Claims priority, application Japan, Mar. 2, 1987, 62-30300; Mar. 11, 1987, 62-35373; Apr. 15, 1987, 61-86857

Int. Cl.[4] B65D *25/08*

U.S. Cl. 206—219 **3 Claims**



1. A plate-like container for containing and in combination with jellied two part components of a two part composition wherein a plurality of depressions are provided in a surface of the container, and both of the jellied two part components of the two part composition are contained in opposite corners of at least one of the same said depressions in a spaced apart relation to each other, with the respective surfaces of the components being inclined from an inner rising surface of the corresponding depression to a bottom surface, and in use, the components being mixable within the depression and placed into service in the form of a mixture.

4,811,839

FILM BELT LOADER PACKAGE

Lorne T. Cornell, Rochester; Eugene Sisto, Spenceport; Victoria L. Ohtola, and Lawrence P. Kenney, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 17, 1987, Ser. No. 133,990

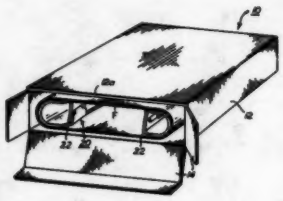
Int. Cl.[4] B65D *85/02;* **G03G** *15/00*

U.S. Cl. 206—303 **15 Claims**

1. Apparatus for packaging a closed loop film belt and facilitating loading of said film belt on support rollers, said apparatus comprising:

means for supporting a closed loop film belt under tension and in a configuration which substantially replicates its configuration when located on said support rollers; and

means for encasing a film belt supported on said support means, said encasing means including means adapted to engage said film belt for urging said film belt off of said



supporting means in order to load said film belt on support rollers.

4,811,840

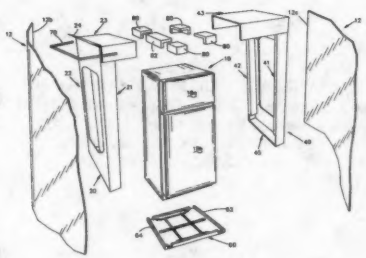
APPLIANCE SHIPPING CONTAINER WITH INTEGRAL CORNER POSTS

David B. Muyskens, Rockford, Mich., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed May 9, 1988, Ser. No. 191,615

Int. Cl.[4] B65D *25/22, 25/26, 25/54*

U.S. Cl. 206—320 **11 Claims**



1. A shipping container for an appliance comprising:

a cardboard enclosure surrounding said appliance, said enclosures being formed from at least two cardboard sheets, said enclosure including vertically extending corner posts integrally formed only from folded portions of said cardboard sheets, said corner posts engaging said appliance, said enclosure having open sides resulting from the folding of said portions so as to permit viewing of said appliance when surrounded by said cardboard enclosure; and

a transparent, flexible, plastic film wrapped about said cardboard enclosure, said film biasing said corner posts toward said appliance to maintain said corner posts in engagement with said appliance, thereby maintaining the position of said appliance within said container so as to provide a unitized package.

4,811,841

BALLOON CONTAINER FOR FLOWERS AND MACHINE FOR MAKING SAME

Peter Domenichiello, 4216 Forest Fire Crescent, Mississauga, Ontario, Canada L4W 3P5

Filed Aug. 24, 1987, Ser. No. 88,564

Claims priority, application Canada, Jun. 23, 1987, 540423

Int. Cl.[4] B65D *85/50, 85/52*

U.S. Cl. 206—423 **8 Claims**

1. A package combination comprising:

(a) an article;

(b) a container having a top and a neck portion adjacent to

said top and adapted to receive and hold said article through an opening in the top, said container being gas-impermeable except at the said top;

(c) an inflated, resilient balloon having a mouth which is resiliently biased around the neck portion of said container and secured in a gas-tight relationship with said neck portion, whereby the combination of said container and said balloon completely encloses said article.

4,811,842

CASE FOR STORING SPARE LEADS

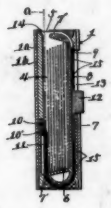
Takashi Sekiya, Soka, Japan, assignor to Chitose Kagaku Kogyo Co., Ltd., Saitama, Japan

Filed Sep. 10, 1987, Ser. No. 94,900

Claims priority, application Japan, Aug. 3, 1987, 62-119005[U]

Int. Cl.[4] B65H *3/22*

U.S. Cl. 206—443 **11 Claims**



1. A case for storing spare lead comprising a chamber for receiving spare leads which is provided in a case body; a lead extraction port which is provided at the upper end of said receiving chamber; a driving piece which has a lid member for said lead extraction port at its upper end and is longitudinally movably received in said case body in such a manner that it can be operated from the outside; and a holding piece for said spare leads which is associates with the lower end of said driving piece in such a manner that it can lift a lead which is located at one side of the chamber under said lead extraction port up through the port when the driving piece is operated to remove the lid from the port wherein the bottom wall of said receiving chamber is inclined downwardly toward said one side so that stored leads are moved successively toward said holding piece as leads are removed from the case.

4,811,843

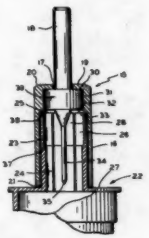
PROTECTIVE DEPLOYMENT APPARATUS FOR ROTARY CUTTING TOOLS

John J. Stribiak, Homewood, Ill., assignor to Precision Carbide Tool Co., Inc., Niles, Ill.

Filed Feb. 16, 1988, Ser. No. 156,296

Int. Cl.[4] B65D *85/24*

U.S. Cl. 206—349 **21 Claims**



1. A protective deployment apparatus for rotary cutting tools having shank and cutting portions for housing and shielding the cutting portion of such cutting tools during shipment and storage and for facilitating the deployment, installation and removal of said rotary cutting tool housed therewithin into conventional gripping elements of machine tool and rotary cutting tool processing equipment, in which said protective deployment apparatus cooperates to alternatively grip and release said tool through cooperation with a conventional gripping collar member radially deployed about the shank portion of said rotary cutting tool, said protective deployment apparatus comprising:

substantially cylindrically shaped tool housing means, having a first end and second end opposite to said first end, for enclosing the cutting portion of said rotary cutting tool when said tool is in a first retracted position;

tool collar gripping means operably positioned within said tool housing means for restrainably and releaseably fixing the position of said gripping collar member and, in turn, the rotary cutting tool affixed therewithin, in position within said tool housing means in said first retracted position;

shank exposure means positioned at said first end of said tool housing means for exposing the shank portion of said cutting tool;

said shank exposure means cooperating with said tool collar gripping means to permit said shank portion, and in turn, said rotary cutting tool, to be operably reciprocated between said first retracted position and a second extended position in which said cutting portion of said cutting tool passes through and out of said second end of said tool housing means with said gripping collar member being released from fixation within said tool collar gripping means;

said tool collar gripping means serving to align said gripping collar with said conventional gripping elements of said machine tool and rotary cutting tool processing equipment, in said first retracted position, for release of said gripping collar therefrom upon said reciprocation of said rotary cutting tool into said second extended position, to enable restrained receipt of said gripping collar by said conventional gripping elements upon deployment of said rotary cutting tool to said fully extended position, for use of said cutting tool and conventional gripping elements in said machine tool and rotary cutting tool processing equipment.

4,811,844

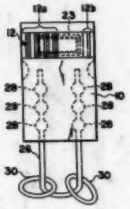
DUAL LAYERED CARD FOR PERMITTING SELECTIVE ACCESS TO AN OBJECT

Thomas S. Moulding, Jr., 214 Via La Soledad, Redondo Beach, Calif. 90277, and Donald G. Ellis, Geneva Park, Boulder, Colo. 80302

Continuation-in-part of Ser. No. 532,038, Sep. 14, 1983, Pat. No. 4,604,847. This application Aug. 6, 1986, Ser. No. 893,867

Int. Cl.[4] B65D *73/00*

U.S. Cl. 206—459 **45 Claims**



1. A device for controlling access to an object comprising two sheets of material disposed in an overlapping relation, said sheets being separably bonded together such that said sheets are capable of being separated substantially only with a tool whereby access to the object is permitted, at least one of said sheets bearing at least one machine readable code.

19. A dual layered card for permitting selective access to an object comprising:

a backing section;

a covering separably bonded to said backing section such that said covering and said backing section are capable of being separated substantially only with a tool;

a machine readable code positioned on the card; and

means for permitting access to the object, at least a portion of said access permitting means being interposed between said backing section and said covering, and said access permitting means being substantially incapable of permitting access to the object when the portion thereof is so interposed and being capable of permitting access to the object when the portion thereof is removed from such interposition relation.

38. A system for selectively providing access to an object including:

a dual layered card including

(a) a backing section;

(b) a covering separably bonded to said backing section such that said covering and said backing section are capable of being separated substantially only with a tool; and

(c) a machine readable code positioned on the card;

means for permitting access to the object, at least a portion of said access permitting means being interposed between said backing section and said covering and said access permitting means being substantially incapable of permitting access to the object when the portion thereof is so interposed and being capable of permitting access to the object when the portion thereof is removed from such interposition relation; and

a machine including

(a) means for guiding the code bearing portion of the card to a selected position;

(b) means for reading the code when the code bearing card portion is in the selected position; and

(c) a tool for separating said covering and said backing section.

42. A package comprising a formed section and a covering for the formed section, the formed section including a first cupped shaped depression disposed toward an associated end thereof and inwardly from the edges thereof and including a second cupped shape depression containing an object and disposed inwardly from the edges thereof, said covering sealingly engaging the formed section except in the area of the depressions and in a portion of the area surrounding the first cupped shape depression, the package further comprising at least one machine readable code positioned in the region of the first cupped shaped depression and the region of said covering disposed over the first cupped shape depression.

4,811,845

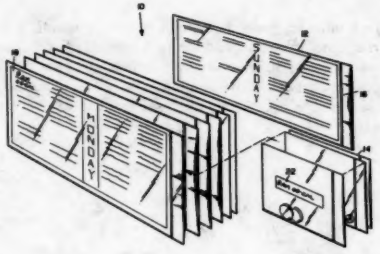
MEDICATION COMPLIANCE PACKAGING SYSTEM AND PROCEDURE

JoBeth Baggett, 701 McCormick, Shreveport, La. 71104

Filed Oct. 6, 1987, Ser. No. 105,109

Int. Cl.[4] B65D *85/56, 83/04*

U.S. Cl. 206—534 **11 Claims**



1. Medication compliance packaging system comprising:

a first container having an opening;

indicia carried by said first container indicative of a day of the week;

a plurality of discrete second containers for disposition within said first container and adapted to contain medication, said second container being removable from said first container through said opening; and

indicia carried by said second containers indicative of the times of said day that the respective medications of the said second containers are to be taken by a patient whereby medications may be accurately dosed from said packaging system at the proper time during that day, said first container having at least a portion thereof defining a window for viewing the interior of said first container, said second containers being disposed in said first container in chronological order of their indicia with such indicia located chronologically one behind the other and with the second container bearing the earliest indicia located to expose its indicia through said viewing window such that, as the second containers are individually removed form the first container in chronological sequence, the indicia of each second container next to be removed appears through said viewing window of said first container.

4,811,846

PIZZA POUCH

Philip M. Bottega, 28 Frandsen Ave., South River, N.J. 08882

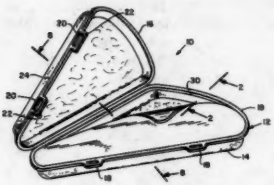
Filed Mar. 16, 1988, Ser. No. 169,023

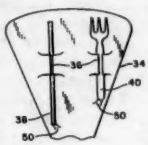
Int. Cl.[4] B65D *81/00, 81/36*

U.S. Cl. 206—542 **1 Claim**

1. A pizza pouch, comprising, a base tray, a cover hinged to said base tray, and flexible panel means provided in said base tray, providing separation for two slices of pizza pie, wherein a first slice of pizza is placed in a bottom portion of said base tray and peripheral side edges of said panel means are engaged within an outwardly angled and downwardly angled groove provided below an upper rim portion of said base tray, and said panel means is frictionally engaged in the groove and separates

a second slice of pizza placed on top of said panel means, and said cover pivots shut over said second slice of pizza on top of





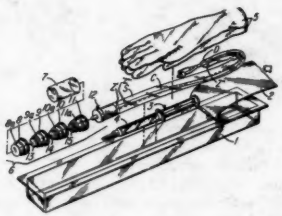
said panel means, with a plurality of cut-out clips through material of said cover, and said clips are spaced apart and engage over and retain a fork and straw removably.

4,811,847

URINARY CATHETER PACKAGE

Thomas H. Reif, 5213 Greencroft Dr., Dayton, Ohio 45426; Louis E. Warnken, 197 Lindall Dr., Germantown, Ohio 45327, and Roy A. Snyder, 8705 Cheshire Ct., Jessup, Md. 20794

Filed Mar. 14, 1988, Ser. No. 167,360
Int. Cl.[4] B65D *83/10*
U.S. Cl. 206—571 **12 Claims**



1. A unitary package sealed in sterilized condition for holding an urinary catheter and protective parts therewith comprising:

enclosure means including a seal having a pull-tab;

an end cap as one of the protective parts mounted telescopically relative to each other;

at least three intermediate (first, second, and third) caps each having closed proximal ends and having antiseptic soaked sponge tips carried thereon also as protective parts mounted telescopically and progressively relative to each other;

a tube-like guide having a distal end and having a covered proximal end telescopically fitted to one of said intermediate caps;

a urinary catheter having one end projecting axially through said guide;

a tube-like protective shroud for said urinary catheter;

a predetermined amount of biocompatible lubricant located adjacent to the covered end of said guide and having the one end of the catheter projecting axially through said guide also projecting into the lubricant;

a syringe containing a predetermined amount of bacteriostatic water and housed sterilized in said enclosure means;

sterilized gloves means housed in said enclosure means and a peel-back cover of said enclosure means;

said end cap joins in a telescopic fit onto said first intermediate cap;

said first intermediate cap joins in a telescopic fit onto said second intermediate cap;

said second intermediate cap joins in a telescopic fit onto said third intermediate cap;

said third intermediate cap joins in a telescopic fit onto proximal end of said guide;

said protective shroud being bonded to the distal end of said guide;

said antiseptic soaked sponge tips being secured to the proximal ends of said intermediate caps;

said lubricant being contained as located between said third intermediate cap and said guide;

said heat shrunk seal protectively covers and joins said end cap, three intermediate caps, and guide;

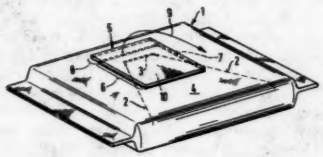
said enclosure means containing said heat shrunk seal, end cap, three intermediate caps having antiseptic soaked sponge tips, guide, urinary catheter, lubricant, protective shroud, glove means, and syringe so that the package may be disassembled in proper sequence progressively such that said urinary catheter may be inserted into the urinary tract under sterile conditions.

4,811,848

PACKAGE WITH A GAS-TIGHT PACKAGE ENVELOPE

Wilfried Jud, St. Poelten, Austria, assignor to Folienwalzwerk Brueder Teich Aktiengesellschaft, Obergrafendor-Muhlhofen, Austria

Continuation of Ser. No. 801,141. Nov. 22, 1985, abandoned, which is a continuation of Ser. No. 491,317, Apr. 18, 1983, abandoned. This application Jun. 1, 1987, Ser. No. 57,163
Int. Cl.[4] B65D *17/32*
U.S. Cl. 206—610 **8 Claims**



1. A package comprising a solid object enclosed in a gas-tight envelope of a flexible sheet-like packaging material provided with zones where the packaging material is doubled and with a tear-open means, the purpose of which is to tear off a strip shaped portion of the envelope beginning with a front edge of this strip-shaped portion for getting access to the enclosed object, characterized in that the tear-open means comprises at least one of a perforation in the form of a line and line of weakness in the packaging material of the envelope along a part of the boundary of the strip-shaped portion of the envelope to be torn off, the front end of the strip-shaped portion being situated outside the zones where the packaging material is doubled and a sheet-like covering element at said at least one of a perforation in the form of a line and line of weakness which covering element has a surface portion having an outer contour within which the entire surface portion of the covering element is bonded to the packaging material by an adhesive, said outer contour enclosing a part of the said at least one of perforation in the form of a line and a line of weakness whereby no perforation in the form of a line is situated outside of the said outer contour, whereby the covering element may be torn off while tearing the envelope along the boundary of the strip-shaped portion of the envelope.

4,811,849

PACKING CONTAINERS AND BLANKS THEREFOR

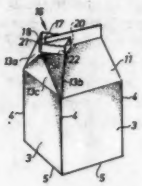
Hans Rausing, Wadhurst Park, England, assignor to AB Tetra Pak, Lund, Sweden

Continuation of Ser. No. 19,175, Feb. 26, 1987, abandoned. This application May 5, 1988, Ser. No. 191,777

Claims priority, application United Kingdom, Mar. 24, 1986, 8607242

Int. Cl.[4] B65D 5/54

U.S. Cl. 206—621.2 15 Claims



1. In a packing container of the type which is manufactured from a plane, substantially rectangular blank of a substantially rigid but foldable and tearable material, said blank including a crease line pattern, an edge zone along one side thereof, and four rectangular end panels adjacent said edge zone, said blank being formed into a tube having two ends, a first of said two ends having a bottom closure and a second of said two ends being closed by a bellow folding including a sealing fin, said sealing fin being formed from said edge zone, two of said four rectangular end panels being placed obliquely to each other and another two of said panels each being divided into three triangular panels and folded inwardly of said tube to form said bellow folding, four material layers of said blank being joined to one another in said sealing fin, the improvement comprising said sealing fin including a top line adjacent said one side thereof and a footline adjacent said bellow folding and a tearing indication is provided in said sealing fin along a line between and parallel to said top line and said footline to weaken the material layers along said tearing indication, a first seal being formed between the material layers between said tearing indication and said footline and a second seal being formed between the material layers between said tearing indication and said top line, said first seal immediately adjacent the tearing indication being substantially weaker than said second seal immediately adjacent the tearing indication so that said tearing indication defines a boundary line between strongly sealed material layers and weakly sealed material layers.

4,811,850

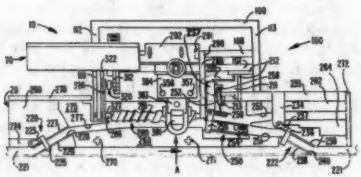
APPARATUS FOR TESTING THE RELEASE TORQUE OF CONTAINER CAPS

Geza E. Bankuty; LeRoy F. Byron, both of Easton, and Joseph J. Cianciullo, West Haven, all of Conn., assignors to New England Machinery, Inc., New Haven, Conn.

Filed Feb. 8, 1988, Ser. No. 153,211

Int. Cl.[4] B07C 5/34; G01L 5/00

U.S. Cl. 209—546 36 Claims



1. Apparatus for testing for a predetermined minimum release torque of container caps at a torque testing station in said apparatus, said apparatus comprising:

A. Means for delivering capped containers to said station;

B. Means for clamping containers at said station;

C. Means for grasping the caps of said containers at said station;

D. Means connected to said cap grasping means for applying a release torque to said container caps; and

E. Means including a strain gauge coupled to said release torque applying means for sensing the level of release torque applied to said caps and providing a signal indicative of said level.

4,811,851

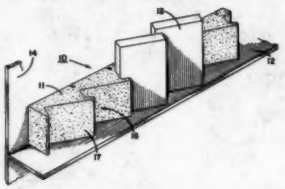
SHELF ORGANIZER

Barry Shane, West Hartford, Conn., assignor to JMC Black, Inc., Rockville, Conn.

Filed Nov. 9, 1987, Ser. No. 118,879

Int. Cl.[4] A47F 7/00

U.S. Cl. 211—41 8 Claims



1. A merchandise shelf organizer for retrofitting to an existing shelf, said shelf having a horizontal bottom surface and a vertical back surface, comprising:

(a) a one piece, elongated body having bottom, top, and back sides, said bottom side and said back side being substantially flat; and

(b) a front side comprising a plurality of parallel vertical slots defined by walls integral with said body and extending forward at an acute angle with said back side; and

(c) said body being attachable to said shelf without damage to said shelf, with said bottom side of said body contacting said horizontal bottom surface of said shelf and with said back side of said body contacting said vertical back surface of said shelf;

whereby, when said body is attached to a shelf, said merchandise may be inserted into said slots and removably supported therein.

4,811,852

APPAREL HOLDER

Thomas J. Kelly, 630 W. Third St., Chadron, Nebr. 69337

Filed Feb. 29, 1988, Ser. No. 161,483

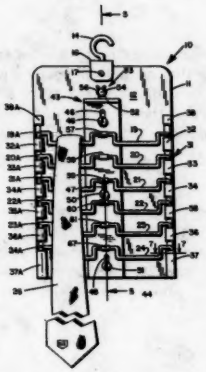
Int. Cl.[4] A47F 5/08

U.S. Cl. 211—119 21 Claims

1. An apparatus for holding a plurality of objects comprising: a base, hanger means attached to the base for mounting the base on a support, a plurality of arms for holding objects, each arm having a first end and a second end, hinge means operatively associated with the first end of each arm for pivoting the arms for movement relative to the base from a first position adjacent the base and a second position spaced from the base, releasable lock means mounted on the base engageable with the second ends of the arms to hold the arms in the first position adjacent the base, and disengageable from the second ends of the arms to allow the arms to be moved from the first position to the second position, said lock means including a plate located adjacent the base movable between a lock position and an unlock position, said plate having hook means engageable

with the second ends of the arms when the plate is in the lock position to hold the arms in the first position, releasable catch means on the base and plate to retain the plate in its lock position, and means mounting the lock means on the base.

13. An apparatus for holding a plurality of articles of clothing comprising: a base having a first side and a second side opposite the first side, hanger means connected to the base for mounting the plate on a support, a plurality of first arms for holding articles of clothing, a plurality of second arms for holding articles of clothing, first hinge mounted on the first side of the base, a second hinge mounted on the second side of the base, said first arms being connected to the first hinge for



movement from a first position adjacent the base to a second position extended away from the base, said second arms being connected to the second hinge for movement from a first position adjacent the base to a second position extended away from the base, releasable lock means engageable with the first and second arms to hold the first and second arms to hold the first and second arms in the first position adjacent the base, the lock means comprising plate means located adjacent the base operable to hold the first and second arms adjacent the base, and means mounting the plate means on the base for movement to a first position to engage the first and second arms and to a second position to disengage said first and second arms whereby the arms can be moved to their second positions.

4,811,853

COMBINATION CONTAINER AND PLURAL-MODE GARMENT SUPPORT

Gary G. Mead, Santa Ana, and George M. Foos, Temecula, both of Calif., assignors to Spartan Container Corp., Orange, Calif.

Filed Jan. 6, 1988, Ser. No. 142,836

Int. Cl.[4] A47F 5/00

U.S. Cl. 211—124 **12 Claims**

1. A combination shipping container and garment support, comprising:

(a) a shipping container adapted to have garments hung therein while said garments are supported on garment hangers, and

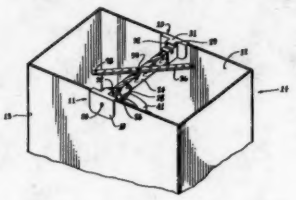
(b) a hanger bar assembly mounted in said container for support of at least several of said hangers and thus the garments thereon, said hanger bar assembly comprising:

(1) first and second end holders mounted on opposed walls of said shipping container,

(2) a hanger bar extended between said end holders and supported thereby, said hanger bar being adapted to support at least several of said garment hangers,

(3) a hold-down bar to hold said hangers on said hanger bar,

(4) means to pivotally mount said hold-down bar on said hanger bar at a location intermediate said end holders, and



(5) means to hold the ends of said hold-down bar when said hold-down bar is in a position substantially parallel to said hanger bar.

4,811,854

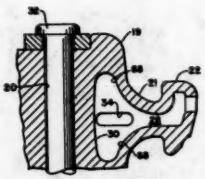
KNUCKLE STRUCTURE TO ENSURE FAILURE AT KNUCKLE THROAT PORTION

William O. Elliott, Pittsburgh, Pa., assignor to McConway & Torley Corporation, Pittsburgh, Pa.

Filed Jan. 7, 1988, Ser. No. 141,525

Int. Cl.[4] B61G 3/04

U.S. Cl. 213—155 **4 Claims**



1. In a knuckle for a railway coupler provided with a pivot pin hole bounded on one side by a integral hollow throat portion and wherein the pivot pin hole is isolated from the interior of the hollow cavity of the throat portion and provided with an intermediate annular supporting surface for the pivot pin, the improvement in said knuckle wherein the kidney core which forms the hollow cavity of the throat portion is provided with a lateral projection which extends through the side wall of the hollow cavity of the throat portion, whereby an opening is left in the aforesaid side wall when the kidney core is removed after casting to provide a point of weakness which will ensure that the knuckle will fracture at the throat portion when the knuckle is under severe stress.

4,811,855

CONTAINER CLOSURE

Magnus Bergström, Bhärred; Stefan Gersbro, and Jan-Olof Fransson, both of Lund, Sweden, assignors to AB Akerlund & Rausing, Sweden

Filed May 31, 1988, Ser. No. 200,651

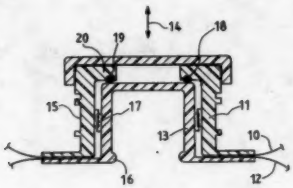
Claims priority, application Sweden, Jun. 9, 1987, 8702379; Jun. 9, 1987, 8702378

Int. Cl.[4] B65D 41/34

U.S. Cl. 215—243 **11 Claims**

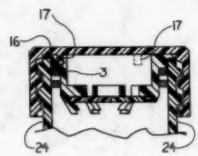
1. In a container closure, comprising a female element arranged for being attached to a flexible container wall, and a male element arranged for being attached to an opposite wall, where the elements are arranged for being brought into sealing engagement for closing a container comprising said container walls, the improvement in that an axially operating sealing device is arranged between the male and female elements, and

that a locking device of the bayonet coupling type, acting between said male and female elements, presses the male and



female elements axially and thereby also the sealing device located between said elements.

4,811,856
TAMPER PROOF BOTTLE NECK INSERT, INDUCTIVELY WELDED TO A PLASTIC BOTTLE
Harry H. Fischman, 9436 Kostner Ave., Skokie, Ill. 60076
Filed May 24, 1988, Ser. No. 198,072
Int. Cl.[4] B65D *41/34*
U.S. Cl. 215—250 **7 Claims**



1. A tamper proof bottle neck insert comprising a cylindrical insert of plastic, a first means adapted to form configurations and projections on the outside periphery of said tamper proof bottle neck insert, to receive and position a perforated or solid coil weld band; A second means adapted to form tapered, flexible disc support projections to securely position and retain a tamper proof disc; A third means adapted to form an internal shoulder on the inside periphery of said tamper proof bottle neck insert with intermittent open sections to enable the mold form that creates the said tapered flexible disc support projections to be withdrawn; A fourth means adapted to form configurations, projections and cavities on the outside periphery of the said tamper proof bottle neck insert, and the inside periphery of a screw or snap on cap to allow the said tamper proof bottle neck insert to be positioned and frictionally retained in said screw or snap on cap; A fifth means adapted to position said cap and said insert into said bottle, and to permanently bond said insert to said bottle by induction.

4,811,857
CLOSURE SYSTEM AND METHOD OF FORMING AND USING SAME
Mortimer S. Thompson, Maumee, Ohio, assignor to Tri-Tech Systems International Inc., Maumee, Ohio
Filed Jun. 17, 1987, Ser. No. 63,162
Int. Cl.[4] B65D *53/02*
U.S. Cl. 215—329 **17 Claims**

1. A container-cap combination for containing, a product comprising:

a container comprising:

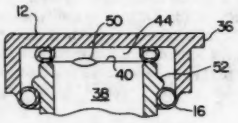
(a) an opening for receiving or discharging the product,

(b) a neck surrounding the opening including a sealing surface; and

(c) means integral with said sealing surface adapted to produce a region of greater deformation in a portion of a sealing means than in the remainder of the sealing means of a cap when the cap is in sealed relationship with the container sealing surface;

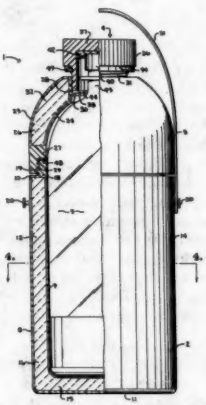
a cap comprising:

(a) a top wall; and



(b) sealing means containing plastic and adapted to form a seal between the cap and the opening of the container, a portion of the sealing means having a region of greater deformation than the remainder of the sealing means when the cap is placed in sealed relationship with the container.

4,811,858
COMBINATION SINGLE BOTTLE COOLER AND LIQUID CONTAINER
Thomas R. Augur, 6712 North Wayne, Gladstone, Mo. 64118
Filed Jan. 28, 1988, Ser. No. 149,401
Int. Cl.[4] A47J *41/00*
U.S. Cl. 215—13.1 **12 Claims**



10. A two liter bottle insulator structure comprising:

(a) a base portion including:

(1) an outer base shell;

(2) an inner base shell positioned within said outer base shell and attached thereto to form a base insulation space between said outer base shell and said inner base shell; and

(3) a base insulation material filling said base insulation space;

(b) a shoulder portion including:

(1) an outer shoulder shell;

(2) an inner shoulder shell positioned within said outer shoulder shell and attached thereto to form a shoulder insulation space between said outer shoulder shell and said inner shoulder shell; and

(3) a shoulder thermal insulation material filling said shoulder insulation space;

(c) said shoulder portion threadedly attached to said base

portion to enclose a bottle within said base portion and said shoulder portion;

(d) a cap formed of thermal insulating material and threadedly attached to said shoulder portion to entirely close said structure;

(e) a body fluid seal positioned between said base portion and said shoulder portion and a shoulder fluid seal positioned between said shoulder portion and said cap such that said structure when assembled is fluid tight to retain a fluid within said structure;

(f) a resilient cap fluid seal positioned within said cap and engageable with an uncapped bottle enclosed within said structure to thereby seal a fluid within said uncapped bottle; and

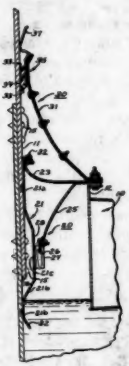
(g) said base portion, said shoulder portion, and said cap are sized and shaped to enclose a substantially standard two liter soft drink bottle within said structure.

4,811,859

SEAL FOR FLOATING ROOF

Mark D. Kinghorn, Jr., 11903 W. 90th Ave., St. John, Ind. 46373

Filed Nov. 27, 1987, Ser. No. 125,702
Int. Cl.[4] B65D *88/46*
U.S. Cl. 220—224 **8 Claims**



1. A sealing system for use with a liquid storage tank having a roof freely floating on the contents stored within the tank comprising

a circumferentially radially outwardly extending primary sealing means for engaging a radially inwardly directed inner wall of the liquid storage tank to form a seal therewith,

said primary sealing means including sealing shoe means resiliently biased into contact with the inner wall of the liquid storage tank for forming a seal thereagainst,

said sealing shoe means comprising two vertically spaced sealing sections spaced apart by a stepped portion to facilitate vertical movement of said sealing shoe means relative to the inner wall of the storage tank,

a circumferentially radially outwardly extending secondary sealing means for engaging a radially inwardly directed inner wall of the liquid storage tank to form a seal therewith,

said secondary sealing means comprising at least two sealing flanges of a first length positioned one on each side of a sealing flange of a second length less than said first length, each of said sealing flanges extending outwardly from a common base towards engagement with the tank walls for forming a seal thereagainst, and

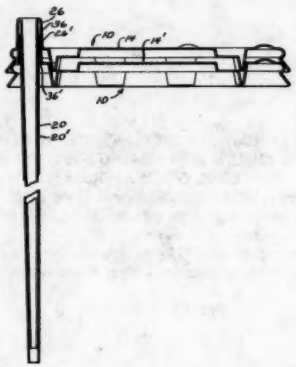
primary sealing means supporting means and second sealing means supporting means, each of said supporting means adapted to be connected to the roof of the liquid storage tank for supporting said primary sealing and said secondary sealing means and applying a force thereto biasing said primary sealing means and said secondary sealing means into sealing engagement with the inner wall of the liquid storage tank forming said seal thereagainst.

4,811,860

NESTABLE DISPOSABLE DRINKING RECEPTACLES

Carl C. Sorenson, and Scott W. Clausen, both of Racine, Wis., assignors to SCCS, Incorporated, Racine, Wis.

Filed Jul. 12, 1988, Ser. No. 217,937
Int. Cl.[4] B65D *41/26, 43/03, 47/06*
U.S. Cl. 220—380 **4 Claims**



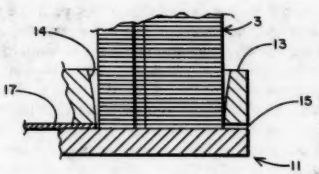
1. An integral lid and straw for a disposable drinking cup, the lid having means for attachment of the lid to a cup; the straw having a beverage engaging region extending below the lid and a user access region extending above the lid; means for nestably receiving the beverage engaging straw region of an adjacent integral lid and straw; means for nestably receiving the user access straw region of an adjacent integral lid and straw whereby a plurality of integral lids and straws may be nested in close relative proximity for high density packaging.

4,811,861

HOMOGENEOUSLY FUSION BONDED CARTRIDGES

John T. Roberts, Clover, S.C., assignor to Poly Pro, Inc., Charlotte, N.C.

Continuation of Ser. No. 733,090, May 13, 1985, abandoned, Continuation-in-part of Ser. No. 421,859, Sep. 23, 1982, abandoned. This application Apr. 29, 1987, Ser. No. 45,223
Int. Cl.[4] B65H *3/24*
U.S. Cl. 221—197 **3 Claims**



1. A dispensing cartridge for use in dispensing individual thermoplastic articles from the cartridge in seriatim order, said cartridge comprising a plurality of stacked individual thermoplastic articles, each said article having a generally planar

interface between adjacent stacked articles and being formed of rigid or semi-rigid thermoplastic material, each said article being fusion bonded about its periphery to adjacent articles in the stacked relationship, the peripheral surface of said cartridge being generally continuous with said fusion bond causing no discontinuity therein produced by melting and with each said article being capable of being non-destructively sheared and separated from an end of said cartridge along said planar interface.

4,811,862

UNIFIED ASSEMBLY FOR CONTROL OF FLUID FLOW AND A LIQUID DISPENSING SYSTEM WHICH INCLUDES SUCH AN ASSEMBLY

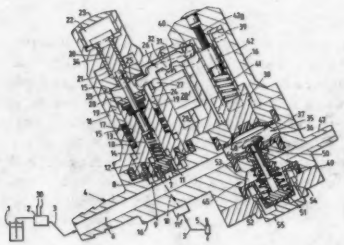
Brian R. Rutty, Weybridge, and John J. Walshe, Minety, both of Great Britain, assignors to Arthur Guinness Son and Company Limited, London, Great Britain

Filed Apr. 27, 1988, Ser. No. 186,614

Claims priority, application United Kingdom, Apr. 27, 1987, 8709910

Int. Cl.[4] F04B *49/00*

U.S. Cl. 222—63 20 Claims



1. A unified assembly for control of fluid flow in a liquid dispensing system and comprising an inlet port and an outlet port; electric switch means for controlling actuation of a fluid pressurising device by which liquid under pressure is intended to be supplied to the inlet port, said switch means having a first condition in which the pressurising device is intended to be operated and a second condition in which the pressurising device is intended to be inoperative; first pressure sensing means which is responsive to fluid pressure at the outlet and reacts when said fluid pressure exceeds a predetermined value to adjust the switch means from its first condition to its second condition; second pressure sensing means which is responsive to fluid pressure at the inlet and reacts when said fluid pressure is less than a second predetermined value to adjust the switch means from its first condition to its second condition, said second predetermined value being less than the first predetermined value; a bleed outlet; a bleed valve normally closing communication between the inlet and the bleed outlet, and a priming facility comprising first means for adjusting the bleed valve to open communication from the inlet to the bleed outlet and second means for adjusting the switch means to its first condition when the fluid pressure at the inlet is less than the second predetermined value.

4,811,863

APPARATUS FOR LIQUEFYING A THERMOPLASTIC PLASTIC

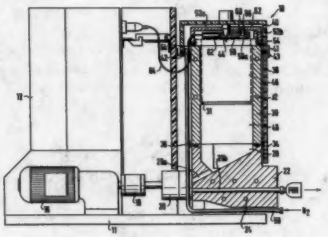
Henning J. Claassen, Industriegebiet Hafen, 2120 Lüneburg, Fed. Rep. of Germany

Filed Dec. 23, 1987, Ser. No. 137,313

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1987, 3702160

Int. Cl.[4] B67D *5/62*

U.S. Cl. 222—146.5 6 Claims



1. An apparatus for liquefying a polyurethane based thermoplastic plastic adhesive comprising:

(a) a heatable sealed supply container having an upper portion for receiving a downwardly open transport container for the thermoplastic plastic adhesive and a lower portion serving as buffer volume,

(b) a first heating means for heating the thermoplastic plastic adhesive disposed in the transport container,

(c) a base portion disposed beneath the supply container and accommodating a collecting trough for the liquefied thermoplastic plastic adhesive,

(d) a cover at the upper end of the supply container, and

(e) a resiliently mounted heating plate disposed at the inner surface of the cover of the supply container.

4,811,864

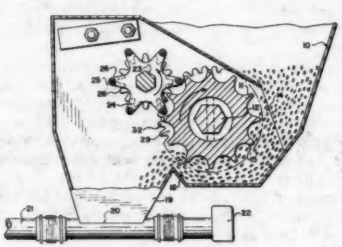
CLEANING ARRANGEMENT FOR A ROLLER METERING DEVICE

Charles Balmer, P.O. Box 34, Elie, Manitoba, Canada R0H 0H0

Filed Aug. 3, 1987, Ser. No. 81,091

Int. Cl.[4] B65D *88/54*

U.S. Cl. 222—148 1 Claim



1. Apparatus for metering particulate material comprising an elongate roller having a central axis of symmetry, a first plurality of metering grooves formed in an outer peripheral surface of the roller, each groove extending longitudinally of the roller parallel to the roller axis and defining a substantially constant continuous cross-section along the roller which cross-section forms a smoothly curved cup-shaped surface recessed from

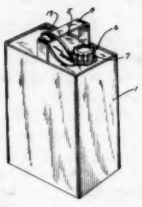
said peripheral surface of the roller, said grooves being spaced angularly around said roller, means mounting the roller for rotation about said roller axis and adapted such that said particulate material in a container thereof can be engaged with said roller along the length of said grooves, drive means for rotating said roller at a desired speed such that each groove grasps and carries within its bounds a volume of said material, and means for cleaning said grooves of said roller as the roller rotates comprising a drive member rotatable about a longitudinal axis parallel to and spaced from the roller axis, a second plurality, equal to one half of the first plurality, of cleaning members carried by and projecting outwardly from said drive member in angularly spaced relation therearound, each of said cleaning members having a longitudinal extent not less than the length of the grooves, and synchronizing means for drivingly rotating the drive member at an angular velocity twice that of the roller, such that each groove as it rotates receives a cleaning member therein with the cleaning member rotating with the groove while the cleaning member moves relative to the groove to sweep around said curved surface of the groove, each of the cleaning members comprising an elongate straight rod parallel to the axis of the drive member and having an outer surface which is smoothly curved with a radius of curvature less than that of the surface of the grooves, means mounting the rod at a fixed radial spacing from the axis of the drive member such that each rod is held against radial movement as it moves past the groove, the rods being spaced to allow material to fall therebetween, the thickness of the rods being such that they are rigid and do not deform as they move past the grooves, the position of the drive member relative to the roller and the position of the outer surface of the rods relative to the drive member being arranged such that the outer surfaces of the rods are maintained at a substantially constant clearance from the curved surface of the groove to prevent contact therebetween.

4,811,865

CAP AND SPOUT ASSEMBLY FOR A CAN

Raymond Mueller, Jr., Hilbert, and Richard Nelson, Fox Point, both of Wis., assignors to Western Industries Inc., Milwaukee, Wis.

Filed Sep. 24, 1987, Ser. No. 100,546
Int. Cl.[4] B67B *5/06*
U.S. Cl. 222—153 **5 Claims**



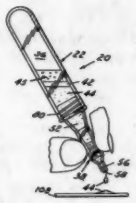
1. A combination cap and spout assembly for a container, comprising an annular cap to be engaged with an outlet in the container and having a central opening, a spout removably connected to the cap and having a flange to engage an annular edge bordering the central opening in the cap, a flexible elongated strap having one end connected to the cap and having a distal end, said cap having a passage separate from said opening, a pair of oppositely facing abutments disposed on said cap and bordering said passage, each abutment being disposed generally normal to the axis of said passage, and a plurality of barbs spaced along the length of said strap, each barb having a sloping surface facing the distal end of the strap and a shoulder facing the first end of the strap, each shoulder being disposed generally normal to the longitudinal dimensions of said strap, said strap being constructed and arranged to be inserted through an aperture on the container and then inserted into either end of said passage to cause a shoulder of a barb to engage a respective abutment to lock the strap to the cap.

4,811,866

METHOD AND APPARATUS FOR DISPENSING LIQUIDS

Tipton Golias, Beaumont, Tex., assignor to Helena Laboratories Corporation, Beaumont, Tex.

Filed Jan. 2, 1987, Ser. No. 266
Int. Cl.[4] B67D *5/58*
U.S. Cl. 222—189 **9 Claims**



1. Apparatus for dispensing a liquid from a container having at least one opening, comprising:

a flexible elongated member having a longitudinal axis and having a bore therethrough, said flexible elongated member being adapted to be connected to said container at said one container opening;

said flexible elongated member connected to said container to form a substantially fluid-tight seal;

said flexible elongated member including a first tapering fluid constricting portion which receives a filter therein, and a second tapering fluid constricting portion, said first and second tapering fluid constructing portions being longitudinally spaced apart and interconnected by a body portion;

said apparatus having first and second outermost ends, said second outermost end extending transverse to the longitudinal axis and including an opening therein in communication with said bore; and

whereby said flexible elongated member as connected to said container forms a continuous passage through which liquid flows from said container through the opening in said container and through the bore of the flexible elongated member, in response to external force applied upon said flexible elongated member in a generally inward direction.

4,811,867

PARTICLE ANTI-BRIDGING APPARATUS

William J. Deyle, Jr., Penfield, and John M. Wysocky, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 13, 1985, Ser. No. 711,136
Int. Cl.[4] G01F *11/00*
U.S. Cl. 222—231 **12 Claims**

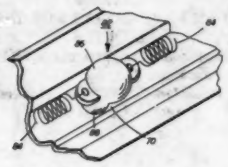
1. An apparatus for preventing the bridging and caking of particles in an open ended chamber of a container dispensing the particles therefrom into a transport adapted to move the particles, including:

a member;

a first spring extending from one side of said member to a first wall of the container in the open end of the chamber thereof; and

a second spring extending from the other side of said member to a second wall of the container in the open end of the chamber thereof, said first spring and said second spring freely suspending said member, in the chamber of the

container in the region of the open end thereof, in engagement with the transport with said member being agitated as the transport moves the particles causing said first



spring and said second spring to vibrate preventing bridging and caking of the particles being dispensed from the open end of the container.

4,811,868

VALVE FOR AEROSOL CONTAINER TO DISPENSE A GIVEN AMOUNT OF AEROSOL

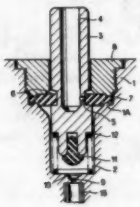
Tomio Nitta, Yokohama, Japan, assignor to Tokai Corporation, Yokohama, Japan

Filed Aug. 27, 1987, Ser. No. 90,065

Claims priority, application Japan, Sep. 12, 1986, 61-139324[U]

Int. Cl.[4] B65D *83/14*

U.S. Cl. 222—462.2 **1 Claim**



1. A valve mechanism for a pressurized aerosol container to dispense a predetermined amount of aerosol comprising:

a base solid having a substantially straight hole, said hole having an inlet at the bottom thereof, said inlet being adapted to communicate said hole and said aerosol container and having a multiple-step inlet valve seat;

a valve stem slidably inserted within said hole, said valve stem being provided with an annular recess around the periphery thereof at substantially a middle section thereof and with a longitudinal channel having a top opening at a top end of said valve stem and a closed end at the position of said annular recess, said channel further having a side outlet at said annular recess to communicate said channel with said hole, said annular recess having a bottom shoulder perpendicular to the axis of said valve stem and a top shoulder inclined against said axis;

a resilient valve head having a semi-sphere-shape bottom and provided at the bottom of said valve stem in order to open and close said inlet;

a spring means provided in said hole for urging said valve stem away from said inlet; and

a valve ring held within said hole, said valve ring having a central bore engaging with said annular recess to close said side outlet, wherein when said valve stem is in a normal position said valve ring sealingly sits on said bottom shoulder of said annular recess in order to seal both said side outlet and bottom shoulder thereby producing a sealed valve chamber below said valve ring within said hole and when said valve stem is pushed toward said inlet until said resilient semi-sphere-shape bottom of said valve head sealingly sits on said multiple-step inlet valve seat, said valve ring is bent downward by said top shoulder of said annular recess in order to open said side outlet.

4,811,869

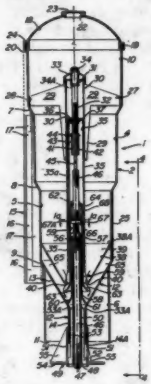
POWDER DISPENSER

Roger Tremblay, 380 Salaberry St.,, West Mercier, Canada J0L 1K0

Filed Jun. 25, 1987, Ser. No. 68,101

Int. Cl.[4] G01F *11/28*

U.S. Cl. 222—440 **4 Claims**



1. A powder dispensing device comprising: a powder container, a lower funnel member fixedly mounted to the lower portion of said container, an upper funnel member movably mounted within said container above and coaxial with said lower funnel member for up-and-down movement between an upper and a lower limit position, so that a measuring chamber of variable capacity be defined therebetween, said lower and upper funnel members forming at their lower, smaller ends an outlet and an inlet port for said measuring chamber, respectively, a lower and an upper valve member mounted in said measuring chamber to close said outlet and inlet ports, respectively, said upper funnel member having a top edge slidable along the inner surface of said container; a transparent window in the wall of said container registering with the top edge of said upper funnel member in all positions of the latter, so that said top edge be visible from the outside of said container; a push rod mounted within said container for longitudinal movement through said ports and defining a lower end portion projecting outwardly from said container; a biasing member carried by said push rod and upwardly biasing said upper valve member, said lower valve member free to close said outlet port under gravity, an abutment member carried by said push rod below said lower valve member to raise the latter to open said outlet port during upward movement of said push rod, said valve members each including a sleeve, provided with a bottom downwardly flared end, each sleeve surrounding said push rod, the sleeve of the upper valve member surrounding the sleeve of the lower valve member and said biasing member, and forming a bushing at its top end bearing on said biasing member, whereby upon the initial part of said upward movement of said push rod froma lower limit position in which said lower valve member closes said outlet port but said upper valve member opens said inlet port, said upper valve member is pushed by said biasing member to close said inlet port, and upon the last part of said upward movement of said push rod, effected against the bias of said biasing member, said abutment member raises said lower valve member to allow outflow of the powder from said measuring chamber; and manually-operated means to adjust the level of said upper funnel member

including a threaded rod coaxial with said push rod thereabove, an elongated sleeve integral with said upper funnel member at its bottom end and threadedly engaging said threaded rod at its top end; a supporting member supported by said container and supporting the top end portion of said threaded rod, said window constituting means engaging the top edge of said upper funnel to prevent rotation of the latter, and knob means fixed to the top end of said threaded rod to rotate the same and thus adjust the level of said upper funnel member.

4,811,870

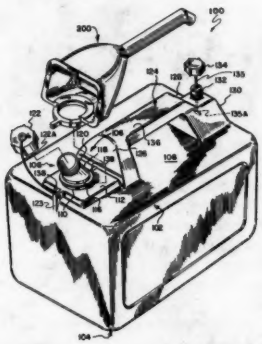
LIQUID CONTAINER WITH ROTATABLE SPOUT

Andrew S. Bianco, Lima, Ohio, assignor to The Dyson-Kissner-Moran Corporation, New York, N.Y.

Filed Mar. 29, 1984, Ser. No. 594,966

Int. Cl.[4] B67D *3/00*

U.S. Cl. 222—461 **1 Claim**



1. Liquid storage and dispensing apparatus comprising:

a one-piece, molded, plastic storage container having substantially rectangular top, bottom, front, back and side walls defining a single, separate, generally cubical container having side walls substantially longer than they are high to provide a stable, low profile,

substantially rectangular, raised platform projecting upwardly from said top wall adjacent one end thereof,

a neck having a base portion projecting substantially perpendicularly upwardly from an upper surface of said platform and an extension projecting angularly with respect to a central axis of said base portion from an upper end thereof,

an annular flange projecting outwardly from said base portion at said upper end thereof,

a handle formed integrally with said container and extending from adjacent an edge of said platform longitudinally of said container,

said handle having a first, relatively wide portion adjacent said platform edge which slopes upwardly, inwardly and away from said platform edge to a relatively narrow bridge portion which extends in spaced relationship to said top wall of said container and terminates at an end portion which slopes downwardly to a chamber projecting upwardly from said top wall at an end thereof opposite said one end,

means defining a vent opening in said chamber,

a one-piece, molded plastic spout having a collar, an upwardly open funnel portion connected to and having a wide opening adjacent said collar and tapering inwardly away from said collar to an elongated closed nozzle portion of relatively smaller cross-sectional area with an upstream end of said nozzle portion communicating with a downstream end of said funnel portion, and

said collar being mounted on said base portion of said neck intermediate said flange and said upper surface of said platform, and rotatable, while continuously attached to said neck, between a stowed position overlying said handle with a lower surface of said spout in closely spaced relationship to an upper surface of said handle, and a dispensing position projecting outwardly of said container with said lower surface of said spout disposed beneath an upper surface thereof.

4,811,871

LIQUID DOSING DEVICE

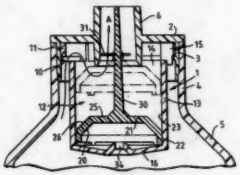
Anthony Wass, Stamford, and Brian Law, Leicester, both of Great Britain, assignors to The English Glass Company Limited, United Kingdom

Filed Dec. 11, 1987, Ser. No. 131,677

Claims priority, application United Kingdom, Dec. 17, 1986, 8630207; Apr. 2, 1987, 8707862; Aug. 19, 1987, 8719553

Int. Cl.[4] B65D *47/00*

U.S. Cl. 222—477 **17 Claims**



1. A dosing device for dispensing liquid from a container, the device comprising:

(a) a front part having an outlet opening;

(b) means for providing a chamber in the device rearwardly adjacent the outlet opening, the chamber having a front opening facing the outlet opening of the device;

(c) an outlet passage for liquid being dispensed to flow from the container to the outlet opening around the chamber;

(d) an obturator fitting in the chamber and movable therein to a forward position blocking the outlet passage;

(e) means located in said means for providing a chamber for permitting only a restricted flow of liquid from the container into the chamber behind the obturator to influence the movement of the obturator towards the forward position during dispensing of liquid; and

(f) a part providing a convolution of the outlet passage forwardly of the obturator, said convolution-providing part projecting from the front part rearwardly towards the obturator, and having a radially outwardly facing surface for directing a flow of liquid through the outlet passage rearwardly through the front opening of the chamber against the obturator, to exert a back pressure thereon during dispensing.

4,811,872

SECURABLE BEVERAGE DISPENSING SERVER

David D. Boyd, Portland, Oreg., assignor to Boyd Coffee Company, Portland, Oreg.

Filed Aug. 14, 1987, Ser. No. 85,340

Int. Cl.[4] B67D *5/56*

U.S. Cl. 222—610 **4 Claims**

1. A stand for holding at least one beverage container, the container having a bottom and a top of smaller diameter than the bottom, the top having a manually operable spigot for dispensing beverage contained within the container into a cup, the stand comprising:

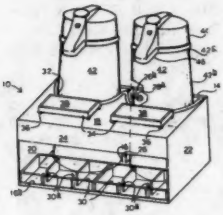
a hollow housing including a base and sides extending upwardly from the base,

the base having a size sufficient to receive the bottom of the container,

a panel elevated from the base fastened to and supported on the sides of the housing,

said panel having a contoured rear edge configured snugly to engage a side of the container in a region of the container between the top and bottom which has a diameter intermediate the diameter of the top and bottom,

said housing having a rear access opening providing access to the interior of the housing to permit placement of the container with the bottom of the container on said base and a side thereof against said contoured rear edge, and



a detachable plate detachable fastened to said housing for at least partially closing said access opening, said plate when fastened to the housing having an expanse opposite said contoured edge and said edge and said expanse bounding opposite sides of a space located therebetween which receives said region of the container, the side-to-side dimension of said space being less than the diameter of the container bottom thus to inhibit withdrawal of the container through said space.

4,811,873

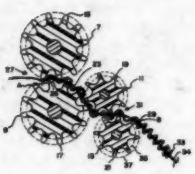
SELF-STRIPPING PLEATING APPARATUS

Edwin C. Ethridge, and Jerry L. Johnson, both of Huntsville, Ala., assignors to Smock Right, Inc., Huntsville, Ala.

Filed May 18, 1987, Ser. No. 50,874

Int. Cl.[4] D05B *35/08, 1/04;* D06J *1/04*

U.S. Cl. 223—32 **11 Claims**



1. In an apparatus for stitching and pleating or gathering textile and like material, said apparatus including a frame supporting a continuous train of at least four rotatable rollers formed with intermeshing teeth, said rollers including first and second pairs of rollers, each pair comprising upper and lower meshing rollers and each roller having registering circumferential grooves along the length thereof in spaced, substantially parallel relation, the improvement comprising:

a plurality of needles having a pointed tip for piercing said material as said material is fed into said apparatus and an eye end having a thread receiving eye for secured relation of thread therein, each said needle disposed to be supported in said registering circumferential grooves of said rollers, each said needle having a predetermined length and provided with a curved shank portion intermediate said tip and eye end, said tip positioned between a first of said pair of rollers, and said eye end positioned in the range of 1/64" to ¾" outwardly of an arc prescribed by rotation of a point on the outer periphery of the lower of a second of said pair of rollers, the distance being measured in the direction of the radius of the arc, whereby, in response to said material being pierced by and gathered on said needles, said material is stripped from said needles and onto said thread by the lower of said second pair of rollers without interruption of the operation of said machine for manual stripping operation.

4,811,874

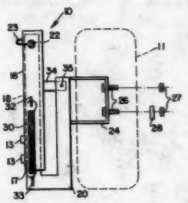
SPARE TIRE CARRIER

Vincent R. Robison, 47901 Pheasant Crest, Avondale, Colo. 81022

Filed Nov. 3, 1987, Ser. No. 116,635

Int. Cl.[4] B62D *43/02*

U.S. Cl. 224—42.21 **17 Claims**



1. A tire carrier adapted to be secured to a vehicle for the purpose of carrying a spare tire, said tire carrier comprising:

(a) an upright tubular housing having upper and lower ends, wherein said lower end is open;

(b) mounting means adapted to secure said tubular housing to said vehicle in a manner such that said housing is vertically disposed;

(c) an elongated leg member slidably received in said tubular housing and being movable within said housing between an upward position and a lowered position;

(d) a tire support arm secured to said elongated leg member;

(e) tire attachment means carried by said support arm for detachably securing said tire to said support arm;

(f) bias means for biasing said leg member toward its said upward position;

(g) first lock means adapted to lock said leg member in said upward position; and

(h) second lock means adapted to lock said leg member in said lowered position;

wherein said leg member is adapted to be lowered in order to remove said tire from said support arm or to attach said tire to said support arm, after which said bias means is adapted to raise said leg member to its said upward position.

4,811,875

PORTABLE AUTOMOTIVE BENCH

Robert P. DiSimone, 1263 Shadow Oak Dr., Malvern, Pa. 19355

Filed Mar. 24, 1988, Ser. No. 172,488

Int. Cl.[4] B60R *11/06;* A47B *3/06, 37/00*

U.S. Cl. 224—42.44 **19 Claims**

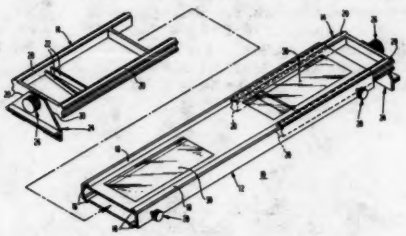
1. A portable bench for resting small items comprising in combination:

a main body member having opposed extremities which are open and having internal glides traversing its length,

a pair of drawers having external longitudinally disposed glides complementary in structure and homologously arranged with respect to said gliders of said main body member,

said pair of drawers being inserted within said main body member at respective opposed extremities thereof and being retained therein in sliding relationship with each other,

support means directly attached to the front of each of said drawers for supporting said bench in an operative posi-



tion, and locking means for attaching said support means to said drawers.

4,811,876

SHOULDER STRAP RETAINER

Michael S. Riggi, 39 Parkhaven Dr., Tonawanda, N.Y. 14150

Filed Feb. 16, 1988, Ser. No. 157,059

Int. Cl.[4] A45F *15/02*

U.S. Cl. 224—264 **11 Claims**

1. A shoulder strap retainer adapted for attachment to the skin of a user for purposes of preventing said shoulder strap for sliding off the shoulder of a user, said retainer comprising:

a base member having a mounting surface carrying a layer of adhesive for removably attaching said mounting surface to the skin of said shoulder and an oppositely facing surface; and

retainer means attached to said oppositely facing surface and defining a retaining surface arranged upon attachment of said base member to said shoulder to upstand therefrom for engagement by said shoulder strap to prevent sliding thereof off said shoulder, and said retaining surface extends annularly of said retainer means.

4,811,877

MODULAR LUGGAGE CARRIER WITH SLIDING TIE-DOWN BRACKET STABILIZED AGAINST LUGGAGE-SECURING FORCES

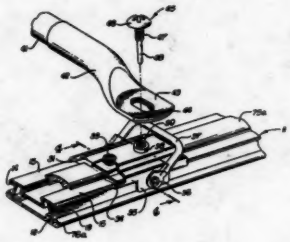
Robert C. Heideman, Studio City, Calif., assignor to Amco Corporation, Hollywood, Calif.

Continuation of Ser. No. 82,788, Aug. 6, 1987, abandoned, which is a continuation of Ser. No. 884,423, Jul. 11, 1986, abandoned, which is a continuation of Ser. No. 439,430, Nov. 5, 1982, Pat. No. 4,616,771, which is a division of Ser. No. 88,864, Oct. 29, 1979, Pat. No. 4,358,037. This application Feb. 26, 1988, Ser. No. 163,234

The portion of the term of this patent subsequent to Oct. 14, 2003, has been disclaimed.

Int. Cl.[4] B60R *9/04*

U.S. Cl. 224—321 **3 Claims**



1. A luggage carrier adapted for substantially permanent attachment to a vehicle, and for use with luggage-constraining straps or the like that in use are cinched tightly over such luggage, generating upward forces on the carrier; said carrier comprising:

a pair of slats adapted for mutually parallel, side-by-side, substantially permanent attachment to and upon such vehicle, each slat having two generally upstanding sides and on each side a laterally projecting flange that is spaced above the vehicle when the slat is attached to the vehicle;

on each slat a slidable bracket that includes:

a housing having a cover portion, above the slat, that spans the width of the slat and has two opposing edges,

said housing also having, fixed to each opposed edge of the cover portion, a wall portion that extends downwardly from the cover portion adjacent to one corresponding side of the slat, past the flange, and

said housing further having, extending inwardly from each wall portion, below the flange, a lip that captures the flange to prevent withdrawal of the housing from the slat perpendicularly to the slat while allowing the housing to slide along the slat,

a clamping member retained within the housing above the slat, and

manually operable means for applying force between the housing and the clamping member to raise the housing relative to the slat so that the lips forcibly engage the flanges to clamp the housing to the slat at any user-selected point along the slat; and

fastened to each bracket housing, a respective tie-down member that is adapted for attachment of such straps or the like and that is secured solely to one or both wall portions of that housing so that in use such upward forces transmitted from such straps or the like to the tie-down member are not applied to the cover portion in such a way as to deform the cover portion;

wherein such upward forces transmitted to the tie-down member are prevented from reducing the forcible engagement of the lips with flanges; and

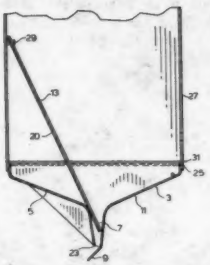
wherein the housing remains effectively clamped to the slat despite the presence of such upward forces.

4,811,878

UNIVERSAL TOWEL DISPENSER

Yutaka Horinchi, Kitchener, Canada, assignor to Twin-Cee Limited, Georgetown, Canada

Filed Feb. 2, 1987, Ser. No. 9,453
Int. Cl.[4] B65H *35/04*
U.S. Cl. 225—46 2 Claims



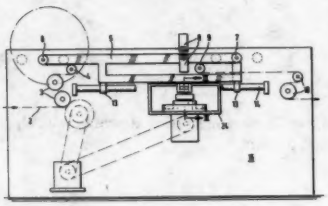
1. A paper towel dispenser comprising a housing and a hopper-like cradle within said housing, said cradle having first and second opposing support surfaces for different types of paper towel products to be dispensed from said dispenser, said housing being provided with a pair of horizontally fixed guide tracks interiorly to either side thereof and said cradle having flat outside edge runners from front to back of said cradle for sliding in and out of said guide tracks and supporting said cradle such that each of said first and second support surfaces slopes downwardly inwardly to a centrally positioned throat formed by downward extensions of said support surfaces, the downward extension of said second support surface terminating in a cutting edge and the downward extension of said first support surface terminating in a pair of spaced apart deflector members bent at an angle extending downwardly beneath said cutting edge, said first support surface having a dispensing opening therethrough and said second support surface being substantially solid, said cradle being reversible within said track from a first to a second dispensing position and when in said first dispensing position said first support surface being located to the front of said dispenser for dispensing C-fold and multi-fold paper towel through said dispensing opening with said cutting edge being generally hidden behind and blocked by said deflectors, said second support surface being located forwardly in said housing with said cradle in said second dispensing position for dispensing single-fold and rolled paper towel through said throat of said cradle, said dispenser including a towel guide usable with said cradle when in said first dispensing position and hung from said housing to guide the dispensing of the C-fold and multi-fold paper towels through said opening in said first support surface, said towel guide including a lower end located in position extending down into said throat of said cradle at substantially right angles to said first support surface of said cradle and said towel guide being hinged to fold upon itself for storing over and covering said dispensing opening in said first support surface with said cradle in said second dispensing position.

4,811,879

APPARATUS FOR MOVING A CARRIAGE OR THE LIKE

Friedhelm Mundus, Lengerich, and Hans-Ludwig Voss, Tecklenburg, both of Fed. Rep. of Germany, assignors to Windmöller & Hölscher, Lengerich, Fed. Rep. of Germany

Filed Jul. 14, 1987, Ser. No. 73,129
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1986, 3623699; Apr. 7, 1987, 3711653
Int. Cl.[4] B65H *17/36*
U.S. Cl. 226—136 7 Claims



1. An apparatus for moving a carriage or the like in one direction over a predetermined distance at a substantially uniform velocity and for returning the carriage at a varying velocity, which apparatus intermittently advances a plastic film web relative to a welding device that is fixed to a frame, comprising

a lever, which is adapted to be pivotally oscillated by a means for driving the lever and which by means of a first guide provided on said lever and extending along said lever and a first slider or roller cooperating with said guide imparts a motion to said carriage, which is movable on tracks in a plane parallel to a plane in which the lever is pivotally movable,

the first slider or roller being mounted on a holder, which is guided for a displacement along a line, which constitutes the base of an isosceles triangle, the sides of which are defined by the lever at end positions of its pivotal movement, and

the means for driving the lever comprising a crank, which revolves in a plane that is parallel to the plane in which the lever is pivotally movable, said crank carried by a driven crankshaft and carrying a crankpin, which carries a second slider or roller movable in a second guide provided on the lever, said second guide disposed on a side of the lever opposite to the side on which the first guide is provided.

4,811,880

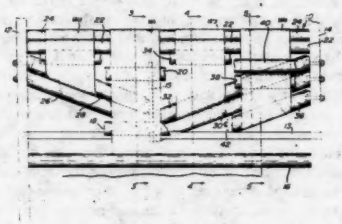
CONTINUOUS WEB HANDLING APPARATUS AND METHOD OF SEPARATING WEB SECTIONS

H. Greggs Farish, Pointe Claire, and Ross Hoge, Westmount, both of Canada, assignors to M-A-N Ashton Inc., Montreal, Canada

Filed Nov. 17, 1987, Ser. No. 121,810
Int. Cl.[4] B65H *20/00, 23/32, 35/02*
U.S. Cl. 226—197 7 Claims

1. An apparatus for separating a plurality of webs to provide a predetermined distance between the edges of the webs, the apparatus including at least three webs being passed through the apparatus, with a first web passing over roll means, the axes of these roll means being at right angles to the longitudinal axis of the first web, the second and third webs on either side of the first web being displaced by providing pairs of bars in the path of the second and third webs, each of the pairs of bars having their respective axes at an obtuse angle from the longitudinal axis and direction of the first web, and the distance between the bars and the angle of the plane passing through the axis of each bar in a pair to the plane of the web entering the pair of bars being such that the existing second and third webs are distanced laterally from the first web; wherein the factors deter-

mining the distance of lateral displacement of the second and third webs relative to the first web is a direct result of said angle of the planes of the axes of each said pair of bars relative



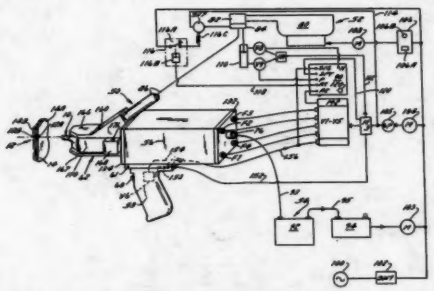
to said plane of the web, entering the respective pairs of bars, and a combination of one or more of the diameters of the bars and the distance between the bars.

4,811,881

APPARATUS FOR SUPPLYING AND INSTALLING PLASTIC EXPANSION RIVETS

Michael E. Heck, Boca Raton, Fla., assignor to Phillips Plastics Corporation, Phillips, Wis.

Filed Nov. 20, 1987, Ser. No. 123,563
Int. Cl.[4] B21J *15/28*
U.S. Cl. 227—4 **16 Claims**



1. Apparatus for supplying and installing expansion rivets, each of which has an expandable body and a relatively movable breakaway mandrel, said apparatus comprising:

an installation tool having a housing with a bore therethrough and comprising rivet holding means on said housing for releasably holding a rivet exteriorily of said bore, a pair of relatively movable components in said bore, each component comprising a hollow piston and a tube and being independently movable between an extended position and a retracted position, the tube of one component slidably receiving the tube of the other component, the tube of said other component having jaws thereon, and a mandrel-receiving tube in said bore and slidably received in the tube of said other component;

supply means operable to supply an expansion rivet through said bore to said rivet holding means on said tool and exteriorily of said bore;

mandrel removal means operable to remove a broken-away mandrel from said mandrel-receiving tube on said tool;

and means for effecting:

movement of both said components to extended position wherein the tube of said one component engages the body of a rivet in said rivet holding means and wherein the jaws of said other component releasably grip the mandrel of the rivet;

movement of said other component to its retracted position to effect movement of said mandrel, expansion of said rivet body and break away of said mandrel;

movement of said one component to its retracted position whereby its tube operates said jaws to effect release of the broken-away mandrel from said other component into said mandrel-receiving tube for removal by said mandrel removal means;

movement of both components back to retracted position;

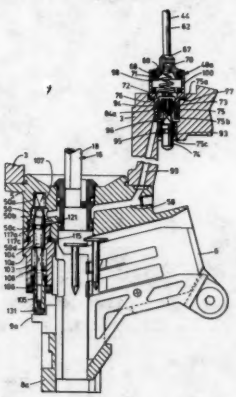
and operation of supply means to supply a rivet through said bore to said rivet holding means before said both components return to extended position.

4,811,882

RESTRICTIVE TRIGGER ACTUATED VALVE ARRANGEMENT FOR A FASTENER DRIVING TOOL

Jay M. Steeves, and Eric H. Halbert, both of Cincinnati, Ohio, assignors to Sencorp, Cincinnati, Ohio

Filed Oct. 26, 1987, Ser. No. 113,597
Int. Cl.[4] B25C *1/04*
U.S. Cl. 227—8 **13 Claims**



1. In a fastener driving tool of the type having a body connected to a source of air under pressure, a manual trigger, a workpiece responsive safety, a cylinder and piston/driver assembly for driving a fastener, a main valve which when actuated opens said cylinder to said air under pressure causing said piston/driver assembly to drive a fastener, a remote valve which when actuated causes said main valve to open, and a trigger actuated valve together with a safety actuated valve which when both are opened actuate said remote valve, said trigger actuated valve comprising a valve body and a stem therein shiftable by said trigger between open and closed positions, said valve body of said trigger actuated valve defining a chamber, said remote valve comprising a body and a stem mounted therein and shiftable therein between actuated and unactuated positions, one end of said remote valve stem being slidably and sealingly engaged in said chamber of said trigger valve, a compression spring within said chamber beneath said remote valve stem end, a bleed passage in said end of said remote valve stem permitting air under pressure within said tool body to enter said chamber and in conjunction with said compression spring to maintain said remote valve stem in its unactuated position, said safety actuated valve comprising a valve body and a stem therein shiftable by said safety between open and closed positions, a passage in said tool body connecting said trigger actuated valve to said safety actuated valve, said chamber being connected to said passage when said trigger actuated valve stem is in its open position, said passage being connected to atmosphere when said safety actuated valve stem is in its open position, the improvement comprising

one of said trigger actuated valve and said safety actuated valve being an on-off valve and the other of said trigger actuated valve and said safety actuated valve being a pressure controlled valve, means in said pressure controlled valve precluding connection of said chamber to atmosphere via said passage to shift said remote valve stem to its actuated position unless said valve stem of said safety actuated valve is shifted to its open position by said safety prior to the shifting of said valve stem of said actuated trigger valve to its open position by said manual trigger.

4,811,883

FASTENING ELEMENT SETTING DEVICE WITH SETTING INDICATOR

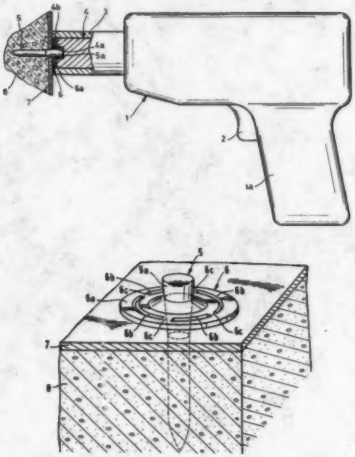
Elmar Thurner, Feldkirch, and Reinhard Buhri, Frastanz, both of Austria, assignors to Hilti Aktiengesellschaft

Filed Dec. 21, 1987, Ser. No. 136,113

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1986, 3643663

Int. Cl.[4] B25C *1/14, 1/18*

U.S. Cl. 227—10 **8 Claims**



1. Explosive powder charge operated setting device for driving a fastening element assembly including a guidance disk, mounted on a fastening element, such as a nail, stud and the like, into a hard receiving material, such as concrete, steel and the like, where said guidance disk encircles and extends radially outwardly from said fastening element, said setting device having a fastening element setting direction and a forward end, an axially extending striker piston axially displaceably mounted in said housing for driving a fastening element assembly in the setting direction out of the forward end of said housing into the receiving material, wherein the improvement comprises that said striker piston has a forward face directed in the setting direction for contacting the fastening element in the driving operation, at least one marking projection formed on and extending outwardly from the forward face of said striking piston for embedment into the guidance disk when excessive driving energy is transmitted by said striker piston to the fastening element assembly.

4,811,884

STAPLER

Hisao Sato, Daini-hikariso, 10, Toyotamaminami 3-Chome, Nerima-ku, Tokyo, Japan

Filed Sep. 23, 1987, Ser. No. 99,939

Claims priority, application Japan, Mar. 10, 1987, 62-34991[U]

Int. Cl.[4] B25C *5/04*

U.S. Cl. 227—83 **1 Claim**

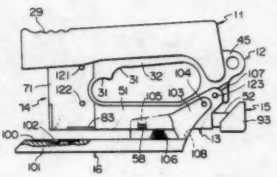
1. A stapler adapted to receive staples therein, comprising:

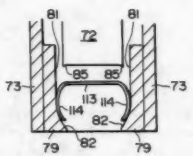
a main body portion having front and rear end portions, and a grip portion between the front and rear end portions so that the grip portion is adapted to be grasped by hand of a user,

a staple drive-out portion attached to the front end portion of the main body portion, said staple drive-out portion including means for pushing the staples out of the staple drive-out portion having a staple drive-out plate member and a spring receptor attached to the staple drive-out plate member, a spring for urging the staple drive-out plate member upwardly, and a staple drive-out opening, said staple drive-out plate member being situated in the staple drive-out opening, said staple drive-out opening being formed by linear portions parallel to each other and curved portions extending downwardly from the linear portions so that the width of the staple drive-out opening is gradually reduced at the curved portions,

a staple guide portion attached to the main body portion, said staple guide portion retaining the staples therein and urging the staples toward the staple drive-out portion,

a pressing lever situated above the main body portion and pivotally connected to the rear end portion of the main body portion, said pressing lever being urged upwardly by means of the spring and having a projection beneath the pressing lever, said projection abutting against the spring receptor so that the force for stapling operation can be substantially directly applied from the pressing lever to the staple drive-out plate member, said pressing lever, when pushed relative to the main body portion, actuating the staple drive-out plate member of the pushing means so





that the staple is inwardly bent while passing through the staple drive-out opening and is ejected from the staple drive-out portion,

a base portion pivotally connected to the rear end portion of the main body portion, said base portion having a guide groove for bending the staple when the base portion is situated under the main body portion and the staple is pushed onto the guide groove,

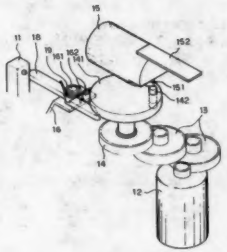
engagement stopper portions formed on the main body and the base portion, respectively, said engagement stopper portions retaining the base portion under the main body when the engagement stopper portions engage with each other, and

an engagement projection formed at a rear portion of the base portion, and grooves formed at the rear end portions of the main body portion, said engagement projection engaging the grooves when the base portion situated under the main body portion is rotated relative to the main body portion, whereby the base portion is retained at a position away from the underside of the main body portion, and the staple is directly applied to an object without being hindered by the base portion.

4,811,885
POWER TRANSMISSION MECHANISM OF AN ELECTRIC STAPLER

Wen-Tan Lai, No. 11, Ya Hsiu Road, Taya Hsiang, Taichung Hsien, Taiwan

Filed Mar. 23, 1988, Ser. No. 174,457
Int. Cl.[4] B25C 5/15
U.S. Cl. 227—131 4 Claims



1. A power transmission mechanism for use in an electrically operated stapler, comprising:

a casing;

an electrical power means coupled to a control switch disposed within the casing;

a pair of speed reducing gears in engagement with each other;

a driven gear in engagement with one of said speed reducing gear;

a flywheel horizontally disposed and mounted on the top end of the axle of said driven gear, with a vertical pin projected from the top surface thereof and located near the peripheral edge thereof;

a ram means having an oblong piece extending from the front end thereof serving as a hitting means, and the underside of said ram means being provided with a vertical wall;

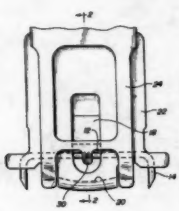
a trigger means in association with a bias spring for permitting the same to be retractably operated;

a link in operative association with said trigger means by pivotably fixing the link to a cylindrical projection on the trigger means, and a coil spring being engaged with both said link and said trigger means so that the link can be resiliently operated in response to the actuation of said trigger means.

4,811,886
STAPLE POSITIONING TAB

Michael A. Murray, Bellevue, Ky., assignor to Ethicon, Inc., Somerville, N.J.

Filed Feb. 18, 1988, Ser. No. 157,025
Int. Cl.[4] A61B 17/00
U.S. Cl. 227—19 7 Claims

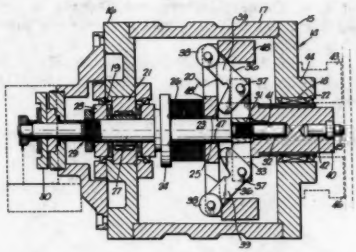


1. In a skin stapler including a staple forming track, a driver reciprocable within said staple forming track from a non-contact position to a forming position, a staple stack constantly urging staples into said staple forming track, an anvil for forming said staples, and a staple release spring for releasing formed staples from said anvil, the improvement comprising retaining means attached to said staple release spring and positioned within said staple forming track wherein said retaining means allows the placement of only one staple from said staple stack within said staple forming track at any one time.

4,811,887
FRICTION WELDING

Clive G. King; John A. Padilla, both Cambridge, and Richard J. Sproulle, Hertfordshire, all of United Kingdom, assignors to The Welding Institute, Cambridge, England

Filed Jan. 14, 1987, Ser. No. 3,132
Claims priority, application United Kingdom, Jan. 17, 1986, 8601083
Int. Cl.[4] B23K 27/00
U.S. Cl. 228—2 10 Claims

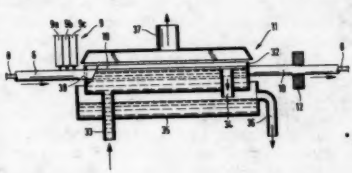


1. Friction welding apparatus for welding a pair of workpieces, the apparatus comprising a drive assembly for causing relative motion between said workpieces while urging said workpieces together, said drive assembly having a rotatable portion; and a load control assembly responsive, at least towards the end of a weld cycle, to the rate of motion of our workpiece relative to the other to cause said workpieces to be urged together under a force which increases in response to a decrease in said rate of relative motion, said load control assembly comprising resilient means for providing at least part of said force urging said workpieces together, and a centrifugal mechanism mounted for rotation with said rotatable portion of said drive assembly and arranged to move radially outwardly in response to an increase in the speed of rotation of said portion to which it is coupled and to apply a force on said resilient means in a direction opposite to said urging direction, said force being related to said rate of rotation of the mechanism.

4,811,888
METHOD AND APPARATUS FOR MANUFACTURING SMALL DIAMETER, THICK WALLED, CABLE SHEATHS

Gerhard Ziemek; Harry Staschewski, both of Langenhagen, and Ewald Gunia, Hannover, all of Fed. Rep. of Germany, assignors to Kabelmetal Electro GmbH, Hannover, Fed. Rep. of Germany

Filed Sep. 8, 1988, Ser. No. 241,598
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1987, 3736123
Int. Cl.[4] H04B 9/00
U.S. Cl. 228—148 12 Claims



1. Method for manufacturing a cable sheath, comprising the steps of:

controllably driving a metal strip in a first longitudinal direction;

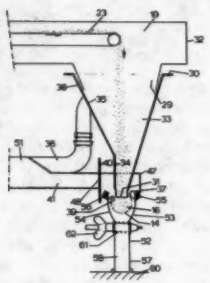
continuously trimming the side edges of the metal strip;
continuously forming the trimmed metal strip into a hollow tubular member;
continuously welding longitudinally abutting edges of the hollow tubular member;
continuously cooling the hollow tubular member in the vicinity of the welding by surrounding at least 60% of its circumferential surface with a coolant, while maintaining the resulting longitudinal welded seam free of the coolant; and
continuously drawing the cooled hollow tubular member in said first longitudinal direction.

4,811,889

METHOD AND APPARATUS FOR THE MANUFACTURE OF POWDER-FILLED STEEL TUBE FROM STEEL STRIP

Arnold J. G. Dackus, Arnhem, and Cornelis G. J. Brasser, Heemskerk, both of Netherlands, assignors to Rijnstaal B.V., Arnhem, Netherlands

Filed Jan. 6, 1988, Ser. No. 141,257
Claims priority, application Netherlands, Jan. 13, 1987, 8700054; Nov. 30, 1987, 8702861
Int. Cl.[4] B23K *31/06, 35/40*
U.S. Cl. 228—148 **10 Claims**



1. Method for the continuous manufacture of powder-filled steel tube from steel strip, comprising moving the strip along a path and in said path performing the steps of (a) forming the moving strip into an open channel (b) introducing powder into said open channel, (c) shaping said open channel after introduction of the powder into a tube by further deformation and closure of the strip edges together, and (d) removing air currents arising in the vicinity of the moving strip by suction extraction at the location where the powder is introduced into the open channel, said step of removing air currents including an upstream end of said location where the powder is introduced into the open channel, in the longitudinal direction of movement of the strip and air is extracted from around the strip at a higher velocity than at a downstream neighboring region of said location.

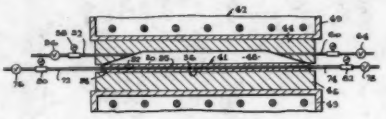
3. Apparatus for the continuous manufacture of powder-filled steel tube from steel strip by moving the strip along a path while performing operations on it, said apparatus comprising (a) means for shaping the moving strip into an open channel, (b) a filling station having means for filling powder into said open channel, (c) means for deforming said open channel after filling of the powder into it, into a tube and joining the strip edges together, and (d) at said filling station suction extraction means to remove air currents around the moving strip at the filling station, said filling means comprising at least one feed hopper having a lower end which has slot-shaped opening extending longitudinally in the direction of movement of the strip and which, in use, projects into said open channel to deliver powder therein, and said suction extraction means having at least one elongate extraction mouth having its elongate direction substantially parallel to the elongate direction of said slot-shaped opening of the hopper and being directed towards said slot-shaped opening.

4,811,890

METHOD OF ELIMINATING CORE DISTORTION IN DIFFUSION BONDED AND UPERPLASTICALLY FORMED STRUCTURES

Charles Dowling, Lawndale, and Roger S. Raymond, Redondo Beach, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 7, 1983, Ser. No. 499,050
Int. Cl.[4] B23K *31/00*
U.S. Cl. 228—157 **21 Claims**



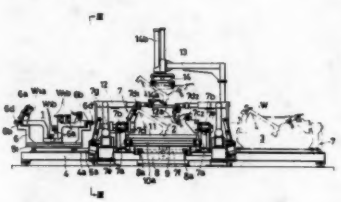
1. A method for eliminating core distortion in the production of core panels formed from metal workpieces of a metal capable of diffusion bonding and superplastic forming, the core of said panels being thin and subject to distortion following superplastic forming, which comprises:
diffusion bonding said metal workpieces at preselected areas in a die,
expanding the unbonded areas of said workpieces by superplastic forming at elevated temperature and pressure into contact with the walls of said die, and forming a core panel, and
following release of said pressure after superplastic forming and during cooling and distortion of said panel in said die, introducing a low differential pressure into the interior of said core panel to expand said panel to its original form, said low internal differential pressure being introduced into said core panel while the metal of said panel is still at a sufficiently elevated temperature so that said metal is still flexible.

4,811,891

METHOD OF ASSEMBLING VEHICLE BODY OF TWO-WHEELED VEHICLE AND ASSEMBLING APPARATUS THEREFOR

Naoji Yamaoka; Shogo Ozawa; Naoki Fukai; Masayuki Yuzawa; Takeshi Nakamura, and Yutaka Asano, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 15, 1988, Ser. No. 181,947
Claims priority, application Japan, Apr. 17, 1987, 62-93265; Jul. 17, 1987, 62-177170
Int. Cl.[4] B23K *9/225*
U.S. Cl. 228—182 **7 Claims**



1. A method of assembling a vehicle body of a two-wheeled vehicle in which, by using a center jig for holding a plurality of center members including a head pipe and cross members and

a pair of side jigs arranged on the left and right-hand sides for holding side frames on the respective left and right-hand sides of said vehicle body, said center members and said side frames are welded together in a state in which said side jigs are erected on both sides of said center jig, said method comprising the steps of:

arranging each said side jig to comprise a jig frame formed of frame materials and holding members attached to the jig frame, said holding members being adapted to position and hold a plurality of side frame members constituting said side frame;

setting said side frame members on respective said side jigs in a state in which said side jigs are prostrated;

welding said side frame members together by welding robots to assemble said side frames; and

erecting said side jigs and welding said center members with said side frames by said welding robots applied through spaces in said frames of said side jigs.

2. An apparatus for assembling a vehicle body of a two-wheeled vehicle comprising:

a center jig mounted on a carriage which is reciprocatable between a set station and a coupling station disposed forwardly thereof, said center jig being adapted to hold a plurality of center members including a head pipe and cross members;

a pair of side jigs disposed on both sides of said coupling station in such a manner as to be freely erected and prostrated, each side jig having a jig frame formed of frame material and a plurality of holding members attached to said jig frame for positioning and holding a plurality of side frame members constituting side frames arranged to be on the left and right-hand sides of said vehicle body; and

at least a pair of welding robots disposed on both sides of said coupling station such that they can not only weld said side frames members to assemble said side frames while said side jigs are in a prostrated posture but also weld said center members with said side frames held on said side jigs in an upright posture through spaces in the frames of said side jigs.

4,811,892

METHOD FOR DIFFUSION WELDING UNDER ISOSTATIC PRESSURE

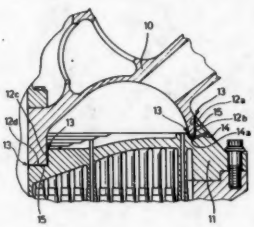
Dieter Kunzmann, Taufkirchen; Helmut Pertler, Haar, and Helmut Seidl, Vagen, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 9, 1987, Ser. No. 31,920

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1986, 3607699

Int. Cl.[4] B23K *35/12*

U.S. Cl. 228—194 **14 Claims**



1. A method for a hot isostatic diffusion welding, at a given diffusion temperature, parts to each other under a given isostatic pressure, comprising the following steps:

(a) providing each of said parts with at least one welding joint forming surface, whereby one surface faces the other surface for forming a welding gap when said parts are assembled,

(b) providing in said welding gap a gap material for forming a metallurgical gap layer in said welding gap, said material of said metallurgical gap layer having a normal melting point, at atmospheric or reduced pressure, below said given diffusion temperature and a higher melting point above said given diffusion temperature at said given isostatic pressure,

(c) sealing said welding gap by heating said gap material to a temperature above said normal melting point sufficient to cause at least a partial filling of the welding gap, e.g. by a gravity enhanced capillary action in said welding gap, prior to application of a hot isostatic pressing, and

(d) subjecting the assembled parts with said metallurgical gap layer solid in said welding gap, to said diffusion temperature and to said isostatic pressure for performing a hot isostatic pressing to cause a diffusion of said metallurgical gap layer into said surfaces without remelting said metallurgical layer thereby permanently joining said parts.

4,811,893

METHOD FOR BONDING COPPER PLATE TO ALUMINA SUBSTRATE AND PROCESS FOR PRODUCING COPPER/ALUMINA BONDED ASSEMBLY

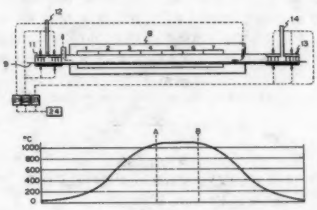
Naoyuki Kanahara; Masahiro Furo, both of Hachioji, and Tetsuo Furihata, Kodaira, all of Japan, assignors to Dowa Mining Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1987, Ser. No. 126,601

Claims priority, application Japan, Dec. 27, 1986, 61-316143

Int. Cl.[4] B23K *35/38, 20/14*

U.S. Cl. 228—198 **6 Claims**



1. A method of bonding a copper plate to an alumina substrate which comprises heating in an inert atmosphere having an oxygen level not higher than 20 ppm a combination of the copper plate and the alumina substrate in contact with each other to a temperature lower than 1,083° C., forming a compound of copper with alumina on the surface of the alumina substrate and a compound of copper with at least one glass forming material on said surface without forming a liquidus eutectic of copper and copper oxide in the area of contact between the copper plate and the alumina substrate, and cooling the assembly.

4,811,894

SLEEVE-TYPE CARRIER HANDLE

Richard L. Schuster, Monroe, La., assignor to Manville Corporation, Denver, Colo.

Continuation of Ser. No. 60,593, Jun. 11, 1987, abandoned. This application Sep. 23, 1988, Ser. No. 249,230

Int. Cl.[4] B65D *5/46*

U.S. Cl. 229—52 B **6 Claims**

1. A sleeve-type article carrier, comprising:

a top panel;

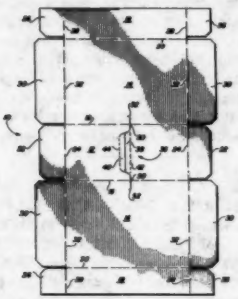
a bottom panel;

two side panels connected to the top and bottom panels along fold lines;

two end panels between the top, bottom and side panels;

the top panel containing a handle opening comprising two spaced substantially parallel edges extending transversely of the fold lines connecting the side panels to the top panel, the spaced edges having ends located in the top panel;

each spaced edge of the handle opening being foldably connected to a tab covering a portion of the handle opening, the tabs terminating adjacent each other between the spaced edges of the handle opening so that the tabs cover substantially the entire handle opening;



one of the spaced edges of the handle opening being located between a point equidistant from the end panels and one of the end panels; and

the top panel containing a slit extending from each end of said one spaced edge, each slit being substantially aligned with said one spaced edge and extending transversely of and through the nearest of the fold lines connecting the side panels to the top panel, each slit terminating in the upper portion of the nearest side panel; and

the side panels being devoid of stress relief lines.

4,811,895

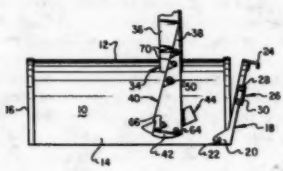
MAILBOX SIGNALING DEVICE

Lewis C. Reinebach, Payson, Ill. 62360

Filed Aug. 12, 1988, Ser. No. 231,524

Int. Cl.[4] B65D *91/00*

U.S. Cl. 232—35 **13 Claims**



1. In combination with a mailbox having a side panel, a door swingable between open and closed positions, and a bracket mounted on said door, a signaling device comprising:

an elongated arm attached by first pivot means intermediate its ends to said side panel for swinging movement relative to said mailbox;

signal means disposed at one end of said arm;

weight means carried on second pivot means located proximate the other end of said arm; and,

said weight means abutting said bracket when said door is closed for arresting swinging movement of said arm in a substantially horizontal position.

4,811,896

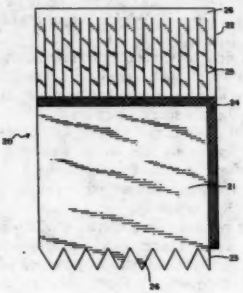
BOTTLE WRAPPER

Yoriko Sohma, Marshfield, Mass., assignor to Sanpho America, Inc., Boston, Mass.

Filed Apr. 28, 1988, Ser. No. 187,596

Int. Cl.[4] B65D *65/00*

U.S. Cl. 229—89 **6 Claims**



1. A sheet for forming a package for containing a bottle comprising:

a wrapper sheet, said wrapper sheet having a bottom portion adapted to be folded over to form a generally circular bottom of a package for containing the bottle, a top portion of said wrapper sheet opposite said bottom portion having a series of slits, said series of slits not extending to the top edge of the wrapper sheet and forming a slotted section of the wrapper sheet adapted to be folded over at the neck of the bottle, said wrapper sheet further including adhesive means to form a generally cylindrical package for containing a bottle.

4,811,897

DUCT TYPE AIR CONDITIONING SYSTEM

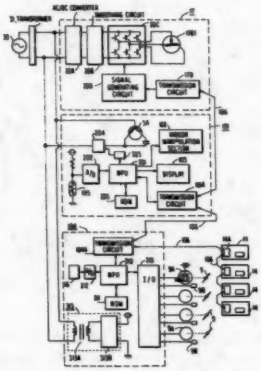
Toyohiro Kobayashi, Shizuoka; Nobuo Otsuka, Kamakura, both of Japan, and Peter Thompson, Cypress, Calif., assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 20, 1987, Ser. No. 16,823

Claims priority, application Japan, Feb. 20, 1986, 61-35501; Feb. 20, 1986, 61-37775

Int. Cl.[4] F24F *7/00*

U.S. Cl. 236—49 **6 Claims**



1. A duct type air conditioning system for performing air

conditioning by distributing temperature adjusted air to a plurality of rooms through an air duct, comprising:

(a) an indoor control device for performing lump and simultaneous air conditioning of said rooms;

(b) a plurality of room controllers adapted to be added as options to said indoor control device after the installation thereof for individually setting and detecting the temperature of each room; and

(c) a variable air volume (VAV) control unit selectively connected to said indoor control device after the installation thereof for transmitting temperature information and room information from said room controllers to said indoor control device, and for adjusting the degree of opening of a damper provided at an air distributing end of the duct of each room in accordance with said temperature information and said room information,

wherein information transmission between said indoor control device and said VAV control unit, and between said VAV control unit and said room controllers, is carried out by digital transmission circuits, and wherein signals transmitted by said transmission circuits comprise serial bit signals and include identification signals for establishing data links between control devices communicating with each other, each of said identification signals including self address signals representing the control device sending the serial bit signals, and including opponent address signals representing the control device receiving the serial bit signals.

4,811,898

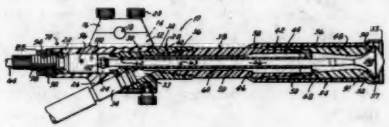
ELECTROSTATIC POWDER SPRAY GUN WITH ADJUSTABLE DEFLECTOR AND ELECTROSTATIC SHIELD

James C. Murphy, Broadview Heights, Ohio, assignor to Nordson Corporation, Westlake, Ohio

Filed Sep. 21, 1987, Ser. No. 99,059

Int. Cl.[4] B05B 5/04

U.S. Cl. 239—3 **15 Claims**



1. An electrostatic spray coating apparatus for spraying particulate powder coating material, comprising:

a spray device formed with a forward end and a powder flow passageway for transmitting particulate powder coating material;

a nozzle mounted within said powder flow passageway at said forward end of said spray device, said nozzle being formed with a discharge opening for emitting particulate powder coating material;

an electrode mounted to a particle deflector, said particle deflector and electrode being axially spaced from said nozzle in the path of particulate powder coating material emitted from said discharge opening of said nozzle, said particulate powder coating material contacting said deflector and being deflected radially outwardly along a powder discharge passageway formed by said axial space between said discharge opening of said nozzle and said deflector through an electrostatic field produced by said electrode within said powder discharge passageway;

means for adjusting said axial space between said particle deflector and electrode, and said discharge opening in said spray device, to vary the radial velocity of said particulate powder coating material discharged through said powder discharge passageway and to vary the concentration of said electrostatic field within said powder discharge passageway;

electrostatic shielding and particle deflecting means carried on said forward end of said spray device for shielding said electrode from objects having a different electrical potential than said electrode and for contacting particulate powder coating material discharged from said powder discharge passageway, said electrostatic shielding and particle deflecting means being axially movable along said forward end of said spray device relative to said particle deflector and said electrode and relative to said discharge opening of said spray device to vary the radial velocity of said particulate powder material ejected from said powder discharge passageway and to vary the degree of electrostatic shielding of said electrode.

4,811,899

APPARATUS FOR GENERATING PRE-INJECTIONS IN UNIT FUEL INJECTORS

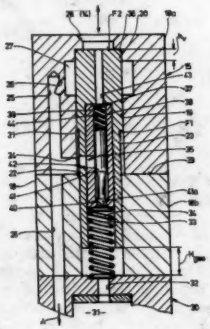
Walter Egler, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 31, 1987, Ser. No. 91,155

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1986, 3629754

Int. Cl.[4] F02M 47/02

U.S. Cl. 239—5 **25 Claims**



1. An apparatus for generating pre-injections in fuel injectors for internal combustion engines, a magnetic valve (10) which controls low pressure fuel into an element chamber (14), a fuel input of said apparatus, an injection valve actuation element (13) which operates a spring biased high-pressure piston (2), an intermediate part (15) and an injection nozzle (16) connected to said intermediate part and operative against a spring (16*b*), said intermediate part includes therein a pre-injection slide (20) that functions under an influence of a fuel pressure generated in said chamber (14) and undergoes a displacement determining a pre-injection quantity with an ensuing main injection by opening a connection to an injection line (25) leading to said injection nozzle (16), whereby a first partial stroke (h_v) of said pre-injection slide (20) keeps a connection of a high-pressure side of said pre-injection slide to said injection line (25) sealed forming a fuel pressure intensification by means of a pressure stage (F1/F2) at said pre-injection slide (20) thereby transferring a pre-injection quantity from a pressure chamber (23) of said pre-injection slide (20) to said pressure line (25), further movement of said pre-injection slide (20) resulting in an opening to said high-pressure side, causing a drop in the nozzle pressure and the high-pressure side is relieved by means of the movement of the pre-injection slide until said pre-injection slide reaches its final stroke, and then the main injection is built up by movement of said high-pressure piston (12) into said chamber (14).

4,811,900

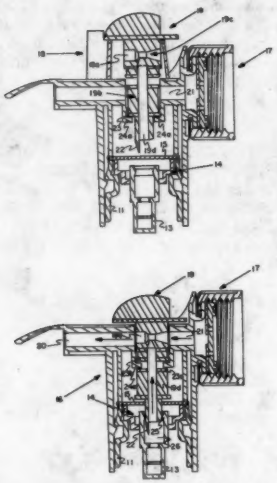
SPRAY APPARATUS

Joseph P. LaRosa, Danbury, and Michael H. Lombardi, Stamford, both of Conn., assignors to Chesebrough-Pond's Inc., Greenwich, Conn.

Continuation of Ser. No. 880,366, Jun. 30, 1986, Pat. No. 4,767,058. This application Apr. 22, 1988, Ser. No. 185,195

Int. Cl.[4] B05B *7/30*; B67B *5/00*; B67D *5/32*

U.S. Cl. 239—10 **3 Claims**



1. A method of dispensing an aqueous spray comprising a liquid chemical composition which comprises:

(a) attaching a container sealed with a a seal, holding the liquid chemical compositions to a spray head having an inlet passage for introducing pressurized water, an outlet passage connected to the outlet of the spray head and a valve means having a passage to connect the inlet and outlet passages, the valve means having an aspirating means for communication between the contents of the sealed container and the water;

(b) manipulating the valve means in the spray head to break the seal on the sealed container and to connect the inlet passage with the outlet passage and the aspirating means and to place the aspirating means in communication with the liquid composition in the container ; and

c) introducing the pressurized water into the inlet passage whereby the liquid chemical composition is aspirated from the container into the spray head to mix with the water and pass through the outlet passage.

4,811,901

PULSE FOG GENERATOR

Robert E. Stevens, Phoenix, Ariz., and Dennis A. Roudebush, Fortville, Ind., assignors to Curtis Dyna-Products Corporation, Westfield, Ind.

Filed May 26, 1987, Ser. No. 53,826

Int. Cl.[4] B05B *7/30*; B01F *3/04*

U.S. Cl. 239—138 **17 Claims**

1. A pulse fog generator including a resonant intermittent combustion device composed of a combustion chamber and an exhaust tube communicating with the combustion chamber, one end of the tube discharging gases resulting from, and discharged under pressure produced by, combustion in the combustion chamber, an antechamber, communicating with said combustion chamber for providing a fuel-air mixture to said combustion chamber, a carburetor for supplying the fuel-air mixture to the antechamber and including a central throat passage, through which intake air flows during operation of the combustion device, a spark generating system, including a power source, for igniting the fuel-air mixture in the antechamber, a tank providing a reservoir of formulation and a formulation line through which formulation flows from the tank to the exhaust tube, the pulse fog generator comprising:

electric starting air supply means, electrically connected to the power source, including;

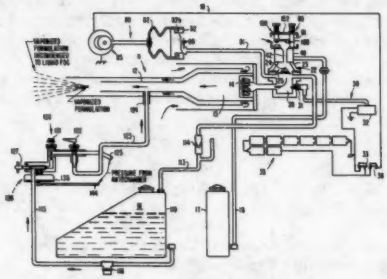
flexible air pumping means for pumping atmosphere air into the antechamber in response to expansion and contraction of said flexible air pumping means; and

air pump driving means for driving said flexible air pumping means and including an electric motor;

priming pump means for directing a quantity of starting fuel into the carburetor, including;

a priming fuel chamber hydraulically communicating with the carburetor; and

a priming pump piston reciprocatable within said priming fuel chamber and operable to draw fuel into said priming fuel chamber, and to discharge the fuel from said priming fuel chamber into said central throat passage of the carburetor;



means for terminating the flow of air through the central throat passage of the carburetor, including;

a shut-off plate movable between a first position preventing the flow of air through the central throat passage and a second position allowing the flow of air through the central throat passage;

a plunger attached to said shut-off plate, operable to move said shut-off plate between said first and second positions;

mounting means for slidably mounting said plunger on the carburetor so that said plunger can be operated to move said shut-off plate into said first position; and

biasing means for normally biasing said shut-off plate into said second position; and

pressure responsive means, adapted to be interposed in the formulation line, for terminating the flow of formulation through the formulation line in response to a cessation in operation of the resonant intermittent combustion device.

4,811,902

SUPERHIGH PRESSURE FLUID INJECTION APPARATUS

Yukiaki Nagata, Uozu, Japan, assignor to Kabushiki Kaisha Sugino Machine, Uozu, Japan

Filed May 12, 1987, Ser. No. 49,729

Claims priority, application Japan, May 13, 1986, 61-110089

Int. Cl.[4] B05B *3/04*

U.S. Cl. 239—240 **4 Claims**

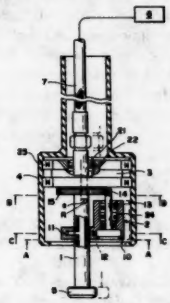
1. A superhigh pressure fluid injection apparatus comprising:

A pipe shaft (1) having first and second ends, wherein a nozzle (5) is mounted on the first end thereof and a superhigh pressure producer is mounted at the second end thereof;

rotating driving means (2) adapted to be actuated by a pressurized fluid produced by said superhigh pressure producer;

a rotary member (3) adapted to be driven into rotation by said driving means (2), said rotary member relatively rotatably supporting said pipe shaft at a position eccentric with the center of rotation thereof by a given distance (e), wherein upon rotation of said rotary member said nozzle is rotated to make a circular motion having a radius of gyration corresponding to the eccentricity (e) of said pipe shaft; and

flow passage means (11) branched from said pipe shaft at a given position thereof to introduce the pressurized fluid into said driving means,



wherein said driving means is fixedly mounted on said pipe shaft and rotates and drives said eccentric rotary member by making a planetary motion about said pipe shaft.

4,811,903

VERY-WIDE-ANGLE NOZZLE UNIT FOR HEADLIGHT CLEANER

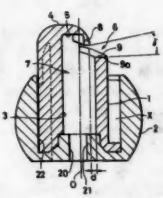
Shigeki Okuma, and Masato Hagiwara, both of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Aug. 26, 1987, Ser. No. 89,453

Claims priority, application Japan, Aug. 26, 1986, 61-199368; Aug. 26, 1986, 61-199371; Aug. 29, 1986, 61-201317; Aug. 29, 1986, 61-201318

Int. Cl.[4] B05B *1/10*; B60S *1/46*

U.S. Cl. 239—284.2 **14 Claims**



1. A very-wide-angle nozzle unit for a headlight cleaner which ejects high-pressure washing water in a forward direction to the headlight of a motor vehicle to wash the headlight to recover the original efficiency of projection of light therefrom, the nozzle unit comprising:

a short cylindrical member (1) having means for defining a vortical flow generation opening (7), said means for defining including a head (4) and a cylindrical wall (3) of said short cylindrical member, said head having an uppermost inside surface (5) facing said flow generation opening;

a washing water ejection port (6) defined by a water cutting end (8) provided on the front of the head (4) of said short cylindrical member and having a first set curvature when being viewed in a backward direction substantially opposite to said forward direction, a top end (9) provided on a top of a front half of said short cylindrical member and corresponding to said water cutting end, and side parts (10) which have a second set curvature when being viewed in said backward direction and which couple said water cutting end and said top end to each other at both side portions thereof, said first and second set curvatures being such that the side portions of said water cutting end and top portions of said side parts form a concave shape (C) facing into said ejection port when viewed in said backward direction said ejection port communicating with said vortical flow generation opening; and

a washing water supply section communicating with an interior of said short cylindrical member.

4,811,904

SPRAY MEDIUM INSET FOR SPRAYING PISTOLS AND A SPRAYING PISTOL SUITABLE FOR APPLICATION OF SUCH INSETS

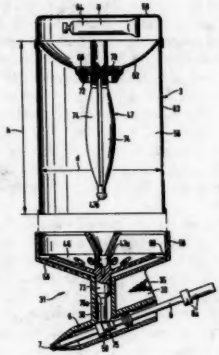
Manfred Ihmels, Lajestrasse 1a, and Hartmut Ihmels, Hauptstrasse 23, both of 2905 Edewecht, Fed. Rep. of Germany

Continuation of Ser. No. 336,386, Dec. 28, 1981, Pat. No. 4,562,965. This application Dec. 10, 1984, Ser. No. 680,006

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1983, 3346165

Int. Cl.[4] B05B *7/30*; A01G *25/14*; A62C *31/02*

U.S. Cl. 239—345 **3 Claims**



1. A spray medium inset for a spraying pistol comprising,

a spray nozzle with a spray opening,

a needle for selectively closing spray opening,

a connecting channel,

a cylindrical tank detachably secured to said connecting channel and formed with an annular lip around a medium opening normally sealed by a first removable cover opposite a tank bottom and having at least a medium chamber accessible through said medium opening for holding spray medium,

means defining said connecting channel for connecting said tank to said nozzle and formed with a cylindrical recess having an inside annular recess extending into a wall surrounding said cylindrical recess for snugly engaging said annular lip,

whereby upon removal of said first cover said cylindrical tank may be inserted into said cylindrical recess with said annular lip snugly seated in said annular recess,

mixing means for mixing said spray medium,

said mixing means comprising a shaft supported in the bottom of said tank and extending predominantly inside said medium chamber,

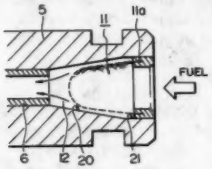
flange means for interconnecting said shaft and the bottom of said tank,

wherein the bottom of said tank is concave and said flange means is formed with a frangible zipper zone.

4,811,905
ELECTROMAGNETIC FUEL INJECTOR

Tooru Ishikawa, Katsuta, and Tokuo Kosuge, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 3, 1987, Ser. No. 56,945
Claims priority, application Japan, Jun. 4, 1986, 61-127969
Int. Cl.[4] F02M 51/00
U.S. Cl. 239—585 7 Claims



1. An electromagnetic fuel injector including an electromagnetic coil, a core defining therein a central bore for passing fuel into the injector, a substantially tubular fuel adjuster disposed in said central bore and defining a fuel passage, said fuel adjuster having an upstream end spaced a distance downstream from an inlet end of said central bore, said central bore in said core having a substantially frusto-conical inner peripheral surface portion disposed between said inlet end of said central bore and said upstream end of said fuel adjuster and converging toward said fuel adjuster to cause a laminar flow of the fuel toward and into said fuel adjuster, a support ring fixed to an inlet end of said frusto-conical inner peripheral surface portion of said central bore, and a substantially frusto-conical filter supported by said support ring and having a frusto-conical outer peripheral surface disposed inwardly of and extending substantially along said frusto-conical inner peripheral surface portion, wherein

said frusto-conical surface portion is substantially similar to an imaginary frusto-conical plane generated by revolution of a line which interconnects an inner peripheral edge of an upstream end of said fuel adjuster and an inner peripheral edge of a downstream end of said support ring;

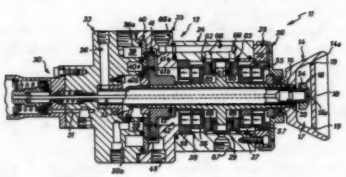
said filter has a portion having a frusto-conical outer peripheral surface positioned between said frusto-conical peripheral surface portion of said core and said imaginary frusto-conical plane and being substantially similar thereto; and

said filter has a downstream end portion having an arcuate form as viewed in an axial section and spaced from said upstream end of said fuel adjuster a distance substantially equal to an inside diameter of said fuel adjuster.

4,811,906
ROTARY SPRAY HEAD SUITABLE FOR ELECTROSTATIC PAINTING

Eric Prus, Moirans, France, assignor to SAMES S.A., Meylan, France

Filed Jul. 3, 1986, Ser. No. 881,923
Claims priority, application France, Jul. 5, 1985, 85 10314
Int. Cl.[4] B05B 5/00
U.S. Cl. 239—703 23 Claims

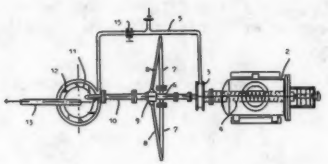


1. Rotary spray head comprising a body, a longitudinal cavity in said body, a shaft in said cavity having a main axis of symmetry defining an axis of the spray head, drive means for rotating said shaft, spray means mounted on one end of said shaft to project axially from said body, means for axially stabilizing said shaft relative to said body, a first magnetic bearing adapted to support said shaft in the radial direction, a second magnetic bearing axially spaced along said shaft from said first magnetic bearing, wherein each of said first magnetic bearing and said second magnetic bearing comprises two magnetized annular parts respectively constituting a stator and a rotor in face-to-face relationship to each other so as to define between them an air gap occupying a plane substantially perpendicular to said main axis of symmetry of said shaft and having respective main axes of symmetry coincident with that of said shaft, wherein the polepieces of said magnetic bearings being disposed so as to produce opposite axial forces on said shaft, thereby creating an unstable equilibrium position of said shaft, and wherein said shaft is entirely suspended radially by said magnetic bearings.

4,811,907
METHOD AND APPARATUS FOR IMPROVING THE GRINDING RESULT OF A PRESSURE CHAMBER GRINDER

Jouko Niemi, Pirkkala; Kaarlo Pyöriä, Tampere, and Heikki Korhonen, Pori, all of Finland, assignors to OY Finnpulva AB and Kemira OY, both of, Finland

PCT No. PCT/FI86/00130, § 371 Date Jul. 24, 1987, § 102(e) Date Jul. 24, 1987, PCT Pub. No. WO87/03219, PCT Pub. Date Jun. 4, 1987
PCT Filed Nov. 20, 1986, Ser. No. 88,159
Claims priority, application Finland, Nov. 26, 1985, 854671
Int. Cl.[4] B02C 19/06
U.S. Cl. 241—5 11 Claims

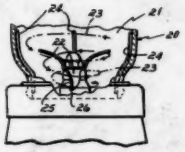


1. A method for improving the grinding result of a pressure chamber grinder, wherein a finely divided material to be ground is fed by means of a mechanical feeding device into a pressurized equalizing tank and the material, which may become clotted in the equalizing tank is made loose by engaging it with a rotor, and the material which is made loose in this way is transferred into a pre-grinder, comprising directing the material into the path of grinding-gas jets applied so that the material to be ground is fluidized, passing the fluidized material and gas mixture flow into a bisecting device so as to cause it to be divided into two component flows of substantially equivalent mangitude and composition, directing each component flow into a main grainding chamber by separately passing each component through a long accelerating nozzle, discharging the nozzles against a collision zone for the two component flows in order to grind the material and to form a homogenous solid gas suspension, passing and accelerating the suspension, by using residual pressure prevailing in the main grinding chamber, through an accelerating tube at high velocity into a free-flow grinder while directing grinding gas into said free flow grinder through substantially tangentially directed grinding-gas nozzles so as to bring the suspension into a rapid circulatory movement so that, by the effect of centrifugal force, coarser material particles stay in this grinder longer and are ground more thoroughly than finer particles.

4,811,908
METHOD OF FIBRILLATING FIBERS

Celeste C. Galati, Johnsonburg, Pa., assignor to Motion Control Industries, Inc., Ridgway, Pa.

Filed Dec. 16, 1987, Ser. No. 133,560
Int. Cl.[4] B02C 19/12
U.S. Cl. 241—21 17 Claims



1. A method of converting previously formed, unbranched but fibrillatable reinforcing fibers into a highly fibrillated, entangled fiber mass which is capable of reinforcing composite materials, said method comprising,

suspending the fibers in an inert liquid,

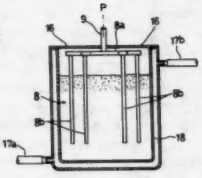
subjecting such suspension to the action of rapidly spinning sharp blades in a vessel, for sufficient time that the fibers become highly fibrillated, and

separating the resulting fibrillated fibers from said liquid.

4,811,909
BALL MILL

Masahiro Inoki, Hirakata, Japan, assignor to Hosokawa Micron Corporation, Osaka, Japan

Filed Mar. 13, 1987, Ser. No. 25,898
Claims priority, application Japan, Mar. 18, 1986, 61-61846
Int. Cl.[4] B02C 17/16
U.S. Cl. 241—33 16 Claims

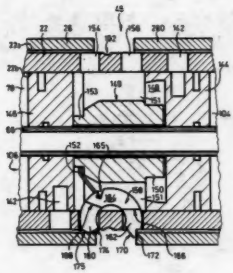


1. A ball mill comprising a lower housing and an upper housing secured to said lower housing by a hinge for movement of said upper housing relative to said lower housing, a container (5) supported by said lower housing and rotatable relative thereto for receiving a material to be pulverized and pulverizing balls, an agitator supported by said upper housing and driven by a drive means, said agitator including arms (8*a*) rotatable on a vertical axis (P) and carrying elongate agitating means (8*b*) extending along and revolvable about the vertical axis (P), all of the arms (8*a*) being disposed in position relative to the material and the balls in the container (5), said upper housing being movable relative to said lower housing for inserting and removing said agitator into and outer of said container, gas supply means for supplying a gas into the container (5) during a pulverizing operation, said gas supply means including gas inlet means (20) disposed in a bottom region of the container (5) and a blower (B) connected to the gas inlet means (20), said container further including water inlet means for supplying water thereto, means for controlling the flow of water, and control means in said container for controlling the height of the water within the container.

4,811,910
CHUCK STRUCTURE

Peter Busenhart, Winterthur; Ruedi Schneeberger, Seuzach; Erwin Holbein, Uttwil; Armin Wirz, Ossingen; Adolf Flueli, and Hansueli Maier, both of Winterthur, all of Switzerland, assignors to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Sep. 26, 1986, Ser. No. 911,816
Claims priority, application United Kingdom, Oct. 2, 1985, 8524303
Int. Cl.[4] B65H 54/20, 54/54
U.S. Cl. 242—18 R 2 Claims



1. A chuck comprising:

an elongated tubular portion rotatable about a longitudinal axis of rotation with an outer circumference adapted to receive at least one bobbin tube for rotation therewith to form a package;

said elongated tubular portion being formed with an internal chamber and at least one pair of openings;

an associated tube-positioning member with a first arm and a second arm;

means mounting said associated tube-positioning member in said internal chamber so as to be movable substantially radially inwardly and outwardly with respect to said longitudinal axis of rotation;

said mounting means mounting said associated tube-positioning member in said internal chamber for movement between a first position in which said first arm passes through one opening of said at least one pair of openings to project beyond said outer circumference of said elongated tubular portion while said second arm is located within said outer circumference and a second position in which said second arm passes through another opening of said at least one pair of openings to project beyond said outer circumference of said elongated tubular portion while said first arm is located within said outer circumference;

said mounting means mounting said associated tube-positioning member in said internal chamber for movement into an intermediate position between said first position and said second position in which both said first arm passes through said one opening of said at least one pair of openings to project beyond said outer circumference of said elongated tubular portion and said second arm passes through said another opening of said at least one pair of openings to project beyond said outer circumference of said elongated tubular portion during such time as said at least one bobbin tube positionally passes over both of said at least one pair of openings;

said first and second arms of said associated tube-positioning member each comprise a respective curved arm portion;

each said opening including wall means; and

each curved arm portion of said first and second arms cooperating with said wall means of said respective one opening and said another opening for guiding said associated

tube positioning member as it moves between said first, intermediate and second positions.

4,811,911

APPARATUS FOR WINDING A RECORDING CARRIER ONTO A PAIR OF SPOOLS

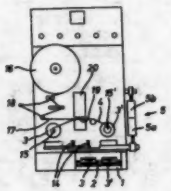
José Toral, and Gottfried Lutz, both of Munich, Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 13, 1987, Ser. No. 73,002

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1986, 3624305

Int. Cl.[4] B65H *19/30*

U.S. Cl. 242—56 R 7 Claims



1. Apparatus for transporting a pair of spools capable of carrying magnetic tape and having a tape leader to and from a winder and holding the spools at the winder during the application of magnetic tape, comprising:

means for conveying a pair of spools having a tape leader to a transfer station, said spools being closely spaced upon delivery, and having the tape leader positioned between them,

a winder assembly for applying magnetic tape to said spools including two mounting pins on which said spools are removably mountable and means for connecting tape leader positioned between the spools to a magnetic tape,

a transfer assembly comprising a swivel arm pivotably mounted on a pivot pin having attached to the swivel arm at a point removed from the pivot pin, means for acting on the swivel arm to pivot the swivel arm on said pivot pin,

a driven first rotatable arm supported perpendicularly to and rotatable in said swivel arm at a point substantially removed from said pivot pin,

a second swinging arm oscillating on said rotatable arm,

a first holder for one of said spools carried on the first rotatable arm and having a surface for mounting said spool and a second holder for one of said spools carried on one end of said second swinging arm, and having a surface for mounting said spool,

a guide element mounted on said second arm at a position away from said second holder and displaceable parallel to the mounting surface of the holder to introduce the interpositioned tape leader into the winder assembly,

said first and second arms constructed and arranged that the plane of rotation of said second swinging arm is parallel to the mounting surfaces of said holders,

said second holder having two positions such that the minimum distance between the holders is equivalent to the distance between the centers of the spools in the conveying means and the maximum distance between the holders is equivalent to the spacing between the mounting pins of the winder assembly,

whereby the spools are delivered to the transfer assembly at the transfer station and received from the transfer assembly at the transfer station.

4,811,912

EMERGENCY LOCKING SEAT BELT RETRACTOR WITH AUTOMATIC LOCKING MECHANISM

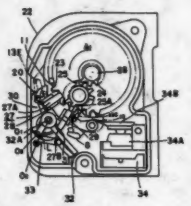
Juichiro Takada, 12-1, 3 chome, Shinmachi, Setagayaku, Tokyo, Japan

Filed Mar. 17, 1988, Ser. No. 169,373

Claims priority, application Japan, Mar. 18, 1987, 62-038528

Int. Cl.[4] B60R *22/38, 22/40*

U.S. Cl. 242—107.4 B 2 Claims



1. A seat belt retractor having a belt reel rotatably mounted in a frame and biassed by a winding spring to rotate in one direction to wind the belt onto the reel, a ratchet wheel coupled to the reel for rotation therewith, a locking pawl supported on the frame for movement between a locking position in engagement with a tooth of the ratchet wheel so as to prevent rotation of the reel in the belt-unwinding direction and an unlocking position clear of the path of the ratchet wheel, means responsive to rotational acceleration of the belt reel in the belt-unwinding direction above a selected level for moving the locking pawl to the locking position and to a selected amount of rewinding of the belt at the urging of the winding spring for automatically urging the locking pawl resiliently to the unlocking position, said acceleration responsive means including a lock ring coupled by a pin and a cam slot to the locking pawl, and automatic locking means activated by rotation of the belt reel upon unwinding of a predetermined length of the belt from the reel for causing the locking pawl to automatically engage the ratchet wheel regardless of the rate of acceleration of the belt reel and thereby lock the reel against rotation in the unwinding direction and deactivated in response to rotation of the reel upon rewinding of a predetermined length of the belt onto the reel, characterized in that the automatic locking means comprises an automatic actuator pawl mounted on the lock ring to pivot between an automatic locking position in engagement with the ratchet wheel and a non-locking position out of engagement with the ratchet wheel, an activating lever having an arm engageable with the actuator pawl, an over-center spring coupled to the activating lever and biassing it to a first position in which the arm moves the actuator pawl to the automatic locking position and also biassing it to a second position out of engagement with the actuator pawl, and means responsive to rotation of the belt reel for pivoting the activating lever between the first and second positions.

4,811,913

COMFORT MECHANISM WITH SLACK SET AND MEMORY

Angel Fernandez, Mount Clemens, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Jul. 6, 1988, Ser. No. 215,648

Int. Cl.[4] B60R *22/34*

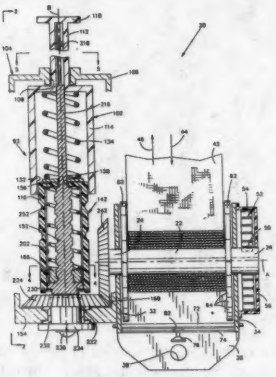
U.S. Cl. 242—107.6 16 Claims

1. An apparatus comprising:

a spindle having belt webbing wound thereon, said spindle being supported for rotation in belt retraction and belt withdrawal directions;

means biasing said spindle to rotate in the belt retraction direction;

a rotatable driven member having a cam surface;
means for rotating said spindle in response to rotation of said driven member; and
a drive member having a longitudinal central axis and being movable in a direction along the longitudinal central axis from a first position to a second position, said drive member being disposed in a coaxial telescoping relationship



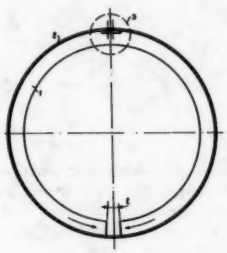
with said driven member and having a drive portion for engaging said cam surface on said driven member to rotate said driven member in response to movement of said drive member to the second position to cause said spindle to rotate in the belt withdrawal direction against said biasing means and pay out a predetermined amount of belt webbing thereby establishing slack in the belt webbing.

4,811,914

WINDING WHEEL FOR HIGH-TEMPERATURE BAKING OF STACKED CAPACITORS

Francois Delalande, and Serge Bon, both of St Pierre de Bresse, France, assignors to Compagnie Europeenne de Compasants Electroniques LCC, Courbevoie, France

Filed Oct. 28, 1987, Ser. No. 113,486
Claims priority, application France, Oct. 28, 1986, 86 14977
Int. Cl.[4] H01G *4/30*
U.S. Cl. 242—56.1 **12 Claims**



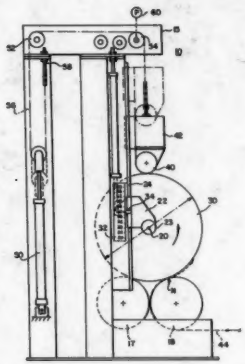
1. A winding wheel for stacked capacitors, comprising:
a hoop formed of a material having a substantially zero thermal coefficient of expansion; and
an annular rim clamped within said hoop so as to control an increase in the diameter of said rim, said hoop being fixed to said rim along a minor portion of the circumference of said rim, the circumference of said rim having a discontinuity of a certain circumferential length, said length being sufficient that ends of said rim on opposite sides of said discontinuity do not touch one another at a temperature sufficient to heat treat capacitors wound on said winding wheel.

4,811,915

RIDER ROLL RELIEVING SYSTEM

R. Duane Smith, Fair Haven, N.Y., assignor to The Black Clawson Company, Middletown, Ohio

Filed Nov. 12, 1987, Ser. No. 119,516
Int. Cl.[4] B65H *17/08*
U.S. Cl. 242—66 **5 Claims**



1. In a rider roll relieving system including
a pair of winding drums,
a core on which a web is wound with the aid of the winding drums,
a rider roll for applying pressure to the core, and the web as it is wound on the core, to control the internal tension of the web, and
means for controlling the pressure applied by the rider roll to the web,
the improvement comprising,
means for sensing the diameter of the web as it is wound onto the core,
means for selecting a first diameter where rider roll relieving action is to be commenced,
means for selecting a maximum rider roll pressure,
means for setting a second, larger diameter where rider roll relieving action is to be terminated,
means for setting a minimum rider roll pressure to be maintained after the relieving action is terminated,
means for providing control signals to said rider roll pressure controlling means for providing a pressure relieving action by controlling the rider roll pressure as a function of the diameter of the web to provide continuous rider roll pressure reduction as the web is wound between said first diameter and said second diameter while maintaining said maximum rider roll pressure until said first diameter is reached and maintaining said minimum rider roll pressure after said second diameter is reached.

4,811,916

FISHING REEL WITH REMOVABLE ROTOR

Shih-Yuan Yeh, 2Fl., No. 2-4, Chen-Hsing Rd., Tai Ping Hsiang, Taichung Hsien, Taiwan

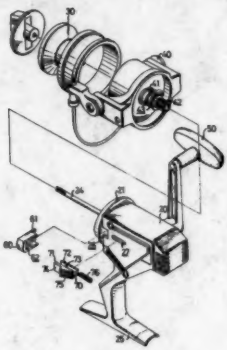
Filed May 17, 1988, Ser. No. 194,959
Int. Cl.[4] A01K *89/01*
U.S. Cl. 242—84.2 R **3 Claims**

1. In a fishing reel comprising a casing serving as a frame for an axially movable spool and a rotor having a gear wheel rotatable by means of a handle, said casing being provided with

a coupling disk adapted to combine with said rotor, and a shaft projecting from said casing for receiving said rotor and said spool, said rotor and said spool being combinable and detachable to said casing, the improvement comprising:

a stem extended from said rotor being provided with an annular groove substantially between said stem and a gear wheel;

a first slot formed on one side of said casing at a position corresponding to said stem after assembly of said rotor and said casing for reception of a clamp member, said clamp member being substantially a horseshoe body, said clamp member having a U-shaped plate protruding from



one side thereof and a slit formed on an opposite side thereof, said U-shaped plate being fittable on said groove; and

a second slot on said casing for reception of a spring-loaded push knob, said push knob including a first plate, a second plate having a size substantially larger than the size of said second slot, and a neck portion connecting said first plate with said second plate, said first plate having a head portion insertable into said slit of said clamp member, and a knob portion disposed on an outer surface of said casing for urging said push knob to move along said second slot either forwardly or rearwardly.

4,811,917

TUBE FOR YARN BOBBINS

Hans B. Nielsen, and Eva K. Nielsen, both of Lutertalstrasse 33, CH-3065 Bolligen/Bern, Switzerland

Filed Jan. 28, 1988, Ser. No. 149,553

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1987, 3703067

Int. Cl.[4] B65H *75/20*

U.S. Cl. 242—118.1 **3 Claims**

1. A yarn bobbin support tube, comprising:

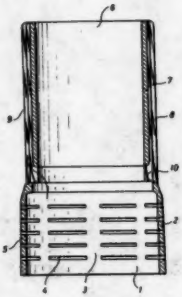
a substantially cylindrical tubular body made of plastic material, said tubular body including a broad end portion coaxially juxtaposed longitudinally spacedly adjacent a narrow end portion, and longitudinally extending means connecting said broad end portion with said narrow end portion;

said broad end portion including a plurality of first openings extending radially therethrough, thereby perforating said broad end portion;

said narrow end portion including a plurality of circumferentially spaced, longitudinally extending external ribs collectively having radially outer surfaces disposed on a notional cylinder having an external diameter, said narrow end portion thereby being externally ribbed to permit bearing a spiral wrapping of yarn thereabout along part of the length thereof, while facilitating application of a fluid treatment to such yarn;

said external ribs having longitudinal extensions beyond said narrow end portion, which provide said connecting means and define second openings radially through said tubular body angularly therebetween;

said narrow end portion being substantially unperforated thicknesswise thereof, and said broad end portion having an open end with an internal peripheral surface having a given diameter which is selected to permit said narrow end portion of a like said yarn bobbin support to be longi-



tudinally removably telescopically nested throughout at least a part of the length thereof in said broad end portion, with the radially outer surfaces of the external ribs of the narrow end portion of the like yarn bobbin support tube engaging the internal peripheral surface of said broad end portion so as to define longitudinal channels between the two yarn bobbin support tubes.

4,811,918

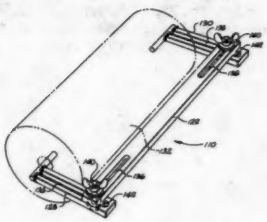
METHOD AND APPARATUS FOR INSTALLING CONTINUOUS LENGTHS OF MATERIAL

Joseph J. Grooms, P.O. Box 9367, Charleston, S.C. 29410

Continuation of Ser. No. 869,617, Jun. 2, 1986, abandoned. This application Dec. 1, 1987, Ser. No. 127,515

Int. Cl.[4] B65H *19/04*

U.S. Cl. 242—55.2 **9 Claims**



1. An apparatus for unwinding material from a full-width roll of such material so that substantially uniform tension is maintained, while stretching the material onto a surface for attachment thereto, across the width of such roll of material, said apparatus comprising:

an elongated friction bar having a width about that of the roll of material, and having respective ends;

first and second insertion members adapted for receipt in respective ends of the roll of material, said insertion members collectively defining a rotational axis with such roll of material freely rotatable about such axis;

first and second connection members physically interconnecting respective ends of said friction bar with said insertion members, respectively, whereby such material may be doubled back and encircled about said friction bar and

drawn-off with tension uniformly distributed across the width thereof due to the encirclement thereof about said friction bar and the friction at such friction bar and the surface of unwound material, such friction occurring by the free rotation of the roll of material about said rotational axis;

connection member adjustment means for allowing the distance between said first and said second insertion members and said elongated bar to be varied during use to correspond to the diameter of a given roll of material; and

elongated friction bar adjustment means carried by said elongated friction bar for allowing the distance between said first connection member and said second connection member to be readily varied to correspond to the width of a given roll of material; wherein:

at least one of said connection members is separate from said elongated bar;

said elongated bar defines an elongated slot therein adjacent at least one of said respective ends; and

releasable fastener means are provided to secure at least one of said connection members to said elongated bar along said elongated slot.

4,811,919

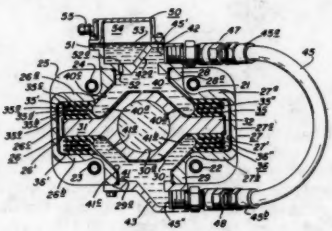
VOLUME COMPENSATED FLUID MOUNT

Peter J. Jones, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Aug. 6, 1987, Ser. No. 83,435

Int. Cl.[4] B64D *27/26*

U.S. Cl. 244—54 **20 Claims**



1. In a fluid mount including a frame adapted to be fastened to a first structure, means providing in said frame opposed separate variable volume liquid-filled working chambers, means located between said working chamber for receiving a second structure movable relative to the frame, each of said chambers having a movable wall portion displaceable in response to movement of said receiving means for pressurizing the liquid contained therein and providing a predctermined volume stiffness, and passage means providing fluid communication between said working chambers for cooperating therewith to define a primary fluid system having predetermined dynamic characteristics, the improvement comprising: means providing an auxiliary chamber containing a quantity of liquid and defining a secondary fluid system, and orifice means providing fluid communication between said secondary fluid system in said auxiliary chamber and said primary fluid system for accommodating variations in the volume of fluid in said primary fluid system, said auxiliary chamber providing said secondary fluid system with a volume stiffness which is lower than the volume stiffness of said primary fluid system, said orifice between said primary and secondary fluid systems cooperable therewith to isolate dynamically the fluid in the secondary fluid system from the fluid in the primary fluid system at predetermined operating frequencies while accommodating said variations in the volume of the fluid in the primary fluid system.

4,811,920

AERIAL DEVICE

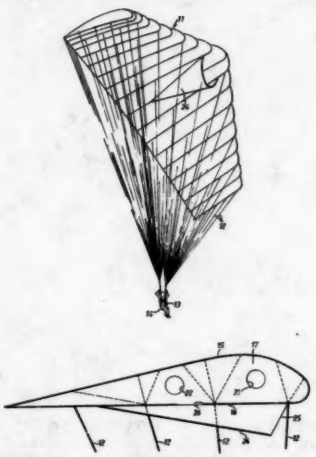
Andrew P. Askwith, St. Albans, and John S. Lingard, Winchester, both of England, assignors to GQ Defence Equipment Limited, Godalming, England

Continuation of Ser. No. 824,555, Jan. 23, 1986, abandoned. This application Feb. 1, 1988, Ser. No. 150,436

Claims priority, application United Kingdom, Jan. 24, 1985, 850752

Int. Cl.[4] B64D *17/02*

U.S. Cl. 244—145 **11 Claims**



1. A load carrying aerial device comprising:

an inflatable component which is inflatable from a collapsed configuration to an inflated aerofoil configuration, said inflatable component including a first wing tip, a second wing tip, an upper surface and a lower surface;

an air intake located on the lower surface of the component and remaining open during inflation of the component and during descent for the maintenance of inflation of the component during flight as a result of relative motion of the component and the surrounding air;

a scoop mounted on the lower surface of said inflatable component for directing air into said air intake; and

a leading edge extending continuously from said first wing tip to said second wing and from said upper surface to said lower surface;

said leading edge of the component throughout substantially its length being closed or maintained closed in flight, the leading edge extending away from the longitudinal axis of the component on each side thereof outwardly to said first and second wing tips and rearwardly to provide in plan form a swept back configuration symmetrical with respect to the longitudinal axis of the component, the internal stagnation pressure of the air within the component at said leading edge produced by the relative motion of the component and the air always exceeding the external static pressure of the air on the leading edge, thereby ensuring maintenance of the profile of the leading edge in flight by air from said air intake.

4,811,921

CYCLIC CONTROL STICK

Charles N. Whitaker, 2834 S. Extension Rd., No. 2024, Mesa, Ariz. 85202, and Richard E. Zimmermann, 425 E. Greenway, Tempe, Ariz. 85282

Filed Jun. 22, 1987, Ser. No. 64,988

Int. Cl.[4] B64C *13/04, 13/06*

U.S. Cl. 244—234 **22 Claims**

1. A cyclic control stick, being capable of operating the

control input mechanism of a helicopter, for reducing injuries and fatalities resulting from the pilot of the helicopter being thrown into contact with said cyclic control stick as a result of a crash or an abnormally abrupt stop, said cyclic control stick comprising:

(a) a tubular standard having upper and lower ends;

(b) a grip on the upper end of said tubular standard;

(c) a stalk body means mounted on the lower end of said tubular standard;

(d) an adapter housing means connected to the control input mechanism of the helicopter; and

(e) separating means for interconnecting said stalk body means and said adapter housing means and for breaking the interconnection therebetween in response to a downwardly directed impact force being exerted on said grip when the impact force exceeds a predetermined value and is exerted for more than a momentary time duration so that said stalk body means, said tubular standard and said grip will separate from said adapter housing means upon the occurrence of such a force.

4,811,922

FLAT WIRE HARNESS ATTACHING UNIT

Norihiro Yoneyama, Aichi, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Aug. 8, 1988, Ser. No. 229,418

Claims priority, application Japan, Aug. 31, 1987, 62-133161[U]

Int. Cl.[4] H02G *3/02*; B60R *16/02*

U.S. Cl. 248—73 **5 Claims**

1. A flat wire harness attaching unit for attaching a flat wire harness to the body or a panel of an automobile, the flat wire harness having a plurality of wires arranged in a plane and integrally connected, the unit comprising:

an attaching means including a bottom plate having a dimension larger than a hole provided in the automobile body and an upper clip upwardly projecting from the plate and being insertable by deformation into a hole provided in the automobile body and normally incapable of drawing out without rupture of some portion once inserted, and

a catching means having a base plate for fixing to the flat wire harness and a catch section perpendicularly extending from the base plate to be engaged with said clip of the attaching means;

characterized in that the attaching means has a means for providing a support to be engaged with said catch section and having a dimension and a material capable of rupturing when said catch section is forcibly pulled out so that the attaching means is made removable from the hole of the automobile body.

4,811,923

MOUNT FOR PHOTOGRAPHIC LIGHTING EQUIPMENT

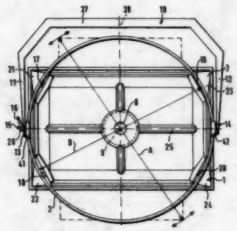
Walter Haberthür, Hofstetten, Switzerland, assignor to Bron Elektronik AG, Ailschwil, Switzerland

Filed Sep. 2, 1987, Ser. No. 92,014

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1987, 702841[U]

Int. Cl.[4] E04G *3/00*

U.S. Cl. 248—278 **8 Claims**



1. A mount for photographic lighting equipment, comprising:

a mounting bracket;

a support ring having a first axis that extends perpendicular to any given diameter of said ring, with the latter being carried by said mounting bracket, and with said lighting equipment being mounted on said support ring in such a way that not only is said lighting equipment rotatable relative to said mounting bracket about a second axis that extends essentially perpendicular to said first axis of said ring, but said lighting equipment is also rotatable about said first axis, said mounting bracket includes means for the mounting bracket to be rotatably mounted about a further axis that is disposed perpendicular to both said first axis and said second axis; said lighting equipment being mounted on said support ring in such a way as to be rotatable relative to the latter about said first axis thereof; and said lighting equipment being provided with guide elements, and in which said support ring is embodied as a profiled ring into which said guide elements extend.

4,811,924

VEHICLE SUPPORT STAND

Douglas L. Walters, Rte. 1, Otwell, Ind. 47564

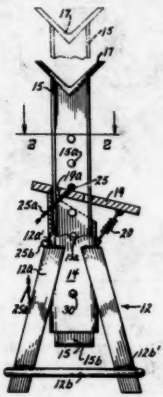
Filed Nov. 13, 1987, Ser. No. 120,074

Int. Cl.[4] E04G *25/00*

U.S. Cl. 248—352 **2 Claims**

1. An equipment support stand comprising a base, a sleeve vertically mounted on said base, a spine member slidable in said sleeve and including a portion receiving said equipment, a control plate through which said spine member extends, said control plate engaging an upper edge portion of said sleeve in a pivotal relationship therewith, tension means connecting said control plate and said sleeve and continually urging said con-

trol plate into a wedged relationship with said spine member, where movement of said control plate away from said wedged relationship with said spine member serves release of said spine member for adjustment to a preselected height, where said



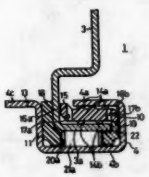
spine member includes a series of spaced-apart vertically disposed openings, and where pin means selectively received in one of said openings immediately above said control plate blocks said control plate at said wedged relationship.

4,811,925

SLIDE RAIL

Yasuyuki Fujita, and Takaichi Nishino, both of Akishima, Japan, assignors to Tachi-S Co. Ltd., Tokyo, Japan

Filed Mar. 7, 1986, Ser. No. 881,842
Int. Cl.[4] B60N *1/08*
U.S. Cl. 248—430 **11 Claims**



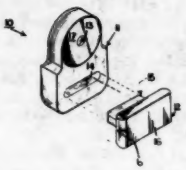
1. A slide rail comprising a movable rail adapted for connection to a seat, said movable rail including a U-shaped lower portion; upper and lower sliders disposed on the top and bottom surfaces, respectively, of a lower flange forming part of the lower portion of said movable rail; and a substantially square shaped fixed rail adapted for fastening to the floor of a vehicle, said lower flange being positioned in said fixed rail, together with said upper and lower sliders, in such a way that said movable rail can be slidingly moved back and forth, wherein said upper slider, which is formed of a material having a desired elasticity, is provided on its top and bottom surfaces with a number of vertically alternating projections, together with projections on its two side surfaces, and said upper slider is also provided with slits extending from said top to said bottom surface and respectively disposed inwardly of said projections on said side surfaces.

4,811,926

PANEL RETAINING APPARATUS

Thomas R. Marsh, Box 273, Wallburg, N.C. 27373, and Raymond Saunders, Rte. #1, Draper, Va. 24324

Filed Nov. 12, 1986, Ser. No. 929,720
Int. Cl.[4] A47G *1/10*
U.S. Cl. 248—488 **5 Claims**



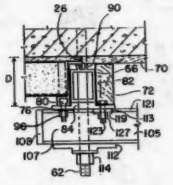
1. In combination, a pendant-like retaining apparatus having interchangeable inserts of various thickness; securing a glass panel within a frame comprising: a base, said base formed from a rigid material, said base defining a mounting port, said base having an upper disk-shaped protrusion on a front face thereof, said base having a lower rectangular tab receptacle, each insert having a flat face and a rectangular tab extending rearwardly of said flat face for positioning within said tab receptacle, said inserts formed from a resilient material, said base being firmly attached to the frame with the disk-shaped protrusion in contact with said frame; a securing means positioned within said mounting port and with one of said insert protruding in a same direction as said disk-shaped protrusion at a greater distance from said front face than the disk-shaped protrusion, and in contact with the glass panel, whereby pressure can be applied to the glass panel by the insert by tightening the securing means.

4,811,927

TUBULAR CONNECTING MEMBER FOR USE WITH CONCRETE FORMING PANELS

Leonid Slonimsky, Toronto, and Dan D. Dorcich, Georgetown, both of Canada, assignors to 589576 Ontario Inc., Mississauga, Canada

Division of Ser. No. 7,501, Jan. 28, 1987. This application Dec. 21, 1987, Ser. No. 135,234
Claims priority, application Canada, Jan. 31, 1986, 500825
Int. Cl.[4] E04G *17/00*
U.S. Cl. 249—210 **7 Claims**



1. A panel connecting member for use with tie rods and panels for a concrete forming structure, which panels each have bolt holding structures along the edges of said panels to be connected, said connecting member comprising an elongated tubular member having two connecting flanges extending outwardly in opposite directions from a first side of said member, bolt receiving means formed in each of said flanges, said receiving means being located to receive bolts whose heads are held in said bolt holding structures, a first hole in said one side of said tubular member for passage of one end of a tie rod, a second hole in a second side of said tubular member opposite said first side for passage of said tie rod, said second hole being aligned with said first hole, and channel-forming,

longitudinally extending projections on the second side of said tubular member, said projections being adapted to receive between them flanges provided on the edges of said panels.

4,811,928

CONTROL CLAMP FOR INFUSION HOSES

Peter Iwatschenko; Wolfgang Wolkenströrfer, both of Neunkirchen; Wolfgang Hofmann, Heroldsbach, and Walter Prell, Hallerndorf, all of Fed. Rep. of Germany, assignors to Pfrimmer-Viggo GmbH & Co. KG, Erlangen, Fed. Rep. of Germany

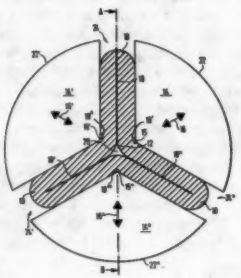
PCT No. PCT/EP86/00701, § 371 Date Jul. 31, 1987, § 102(e) Date Jul. 31, 1987, PCT Pub. No. WO87/03493, PCT Pub. Date Jun. 18, 1987

PCT Filed Dec. 3, 1986, Ser. No. 93,527

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1985, 3542899

Int. Cl.[4] F16K *7/06*

U.S. Cl. 251—7 **8 Claims**



1. A control clamp for adjusting flow rate of a liquid through a flexible hose of an infusion device having a longitudinal axis comprising

at least three clamping jaws of variable relative spacing between which the hose is clamped, each of said clamping jaws being displaceable along radii which intersect the longitudinal axis of the hose and having sharp edges that extend parallel to said longitudinal axis, lie on said radii and engage said hose to vary the cross-sectional flow area thereof, and means for moving said clamping jaws such that said edges move along along said radii, said hose having three guide grooves on the outer periphery thereof which extend parallel to said longitudinal axis and which engage with said sharp edges such that the hose can be clamped symmetrically between the clamping jaws.

4,811,929

NEEDLE VALVE SEAT

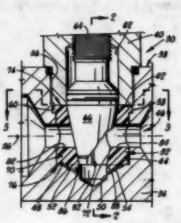
John P. Scaramucci, 10724 Woodridden, Oklahoma City, Okla. 73170

Filed Oct. 26, 1984, Ser. No. 665,001

Int. Cl.[4] F16K *1/38, 1/42*

U.S. Cl. 251—122 **18 Claims**

1. An improved valve seat for a valve of the type wherein valve closure is effected by movement of a frusto-conical valve member lengthwise along a valve closure axis into a frusto-conical valve seat cavity of the valve seat, the valve seat having a wall portion extending circumferentially about the valve member when the valve is closed to define the valve seat cavity and coaxial openings formed through said wall portion to provide fluid communication into the valve seat cavity, wherein the valve seat is characterized as having a groove formed in the wall portion thereof to extend from the valve seat cavity, and said groove being positioned between said



openings and extending parallel to the longitudinal axis of the valve seat cavity.

4,811,930

OVERHANG ARMS FOR RACK AND PINION JACK OF A LIFTING AND DEPOSITING DEVICE FOR TRANSPORTABLE LARGE CONTAINERS OR THE LIKE

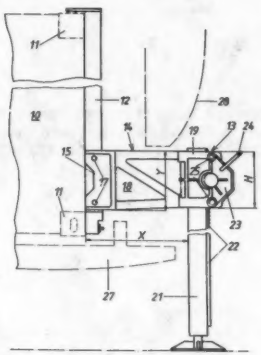
Reinhold Riedl, Miltenberg, Fed. Rep. of Germany, assignor to haacon hebetechnik gmbh, Freudenberg/Main, Fed. Rep. of Germany

Filed Jul. 31, 1987, Ser. No. 79,955

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1986, 3628700

Int. Cl.[4] B66F *7/26*

U.S. Cl. 254—45 **6 Claims**



1. A lifting an depositing device for a transportable large container or the like having a connecting beam at a corner thereof, comprising a support leg having a rack track thereon, a winch movably mounted on said support leg in engagement with said rack track, and an overhang arm adapted to be connected at one end to the connecting beam and at the other end to said winch, the overhang arm having a U-shaped attachment space at said one end for receiving the connecting beam therein in substantially tight-fitting engagement therewith, and a U-shaped guide space at the other end thereof for said support leg, characterized in that:

(a) each overhang arm **(14)** is configured generally in the shape of a wrench having a narrow middle part and forked end parts defining said attachment space and said guide space, and is of generally flat construction, so that its greatest structural height (Y) corresponds approximately to the structural height (H) of the winch **(23)**, and

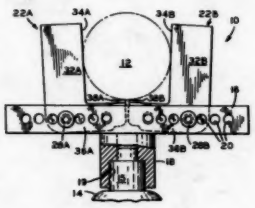
(b) the winch **(23)** is adapted to be detachably connected to

the overhang arm and disposed in one part of the U-shaped guide space (26) for said support leg (21).

4,811,931
CLAMPING ASSEMBLY FOR A JACK

Harold C. Bandy, 4465 Yankee Rd., Jasper, Mich. 49248

Filed Mar. 3, 1988, Ser. No. 163,651
Int. Cl.[4] B66F *3/00*
U.S. Cl. 254—134 15 Claims

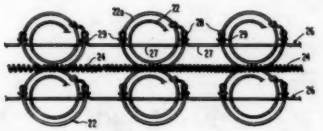


1. A clamping assembly for use on a jack comprising:
a frame including two spaced apart parallel frame members;
a plurality of apertures in each said members, said apertures arranged in a generally straight line, said apertures in respective said members being aligned in pairs;
a mounting member secured to said frame for mounting said frame on a jack;
a first jaw including a generally elongated first leg pivotably disposed between said parallel frame members for pivoting movement on a first pivot pin which extends through a first pair of said aligned apertures, said first leg further including means for mounting said first jaw fixedly on said frame to prevent pivoting movement of said first jaw with respect to said frame, said first jaw having a second leg extending at generally right angles to said first leg, said second leg having a first jaw face thereon;
a second jaw including a generally elongated third leg pivotably disposed between said parallel frame members for pivoting movement on a second pivot pin which extends through a second pair of said aligned apertures, said second jaw having a fourth leg extending at generally right angles to said third leg, said fourth leg having a second jaw face thereon juxtaposed to said first jaw face;
means on respectively said first and third legs for contacting a load disposed between said first and second jaw faces, whereby said first and second jaws will pivot and said load will be clamped between said first and second jaws.

4,811,932
COIL SPRING MATTRESS CORE

John E. Miller, Tupelo, Miss., assignor to Parma Corporation, Denton, N.C.

Filed Jul. 6, 1987, Ser. No. 70,341
Int. Cl.[4] F16F *3/02*
U.S. Cl. 267—95 11 Claims

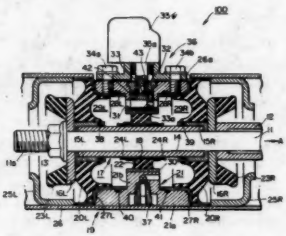


1. A spring assembly for use in a foldable sofa-bed mattress comprising in combination, a plurality of rows of coil springs extending in a first direction and having upper coil portions forming a sleep surface, means interconnecting adjacent coil springs in each row, and a plurality of torsion wires of spring wire material spaced from each other along said first direction and extending in a second direction transverse to said first direction and over said rows of coil springs while respectively interconnecting a plurality of said rows of coil springs, said torsion wires including intermediate portions extending transversely of said first direction and over said coil portions, said torsion wires each including offset portions spaced along the length thereof and extending generally in said first direction in generally horizontal single planes spaced from planes of adjacent runs of said coil springs while being connected to said upper coil portions of each row to provide torsional resistance to loads when in use, and wherein said torsion wires are located only on one side of the coil springs adjacent the sleep surface such that the strength of said one side is greater than the side opposite said one side, said offset portions of said torsion wires are connected to opposed portions of each of said upper coil portions and extend generally in a tangential direction relative to said opposed portions, said intermediate portions of said torsion wires are deflectable in torsion about torsion arms defined by said offset portions while avoiding bending about runs of adjacent coil springs, and said mattress is foldable in said first direction about an axis extending generally along said second direction.

4,811,933
FLUID-FILLED BUSHING

Hiromi Inagaki; Kazuo Matsuura; Tetsuya Koike; Toshihiko Suenaga; Masaru Yorita, and Masaki Izawa, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1987, Ser. No. 112,303
Claims priority, application Japan, Oct. 27, 1986, 61-255059; Oct. 27, 1986, 61-255060
Int. Cl.[4] F16F *5/00*
U.S. Cl. 267—140.1 9 Claims



1. A fluid-filled bushing comprising:
an outer tube;
an inner tube disposed coaxially in said outer tube and including at least a main pipe supporting a radius rod coupled to an axle supporting member, said radius rod being inserted in said main pipe;
two substantially annular resilient partitions coaxially disposed between said outer and inner tubes and defining a fluid chamber therebetween;
a closure member disposed in said fluid chamber for dividing said fluid chamber into two fluid chambers and having a base fitted in said outer tube, first supporting means for axially slidably supporting said inner tube, second supporting means for supporting said first supporting means swingably from said base, and valve means for varying the rate of fluid communication between said divided fluid chambers;
two stopper means fitted respectively over said radius rod near the opposite ends of said main pipe and having rubber stoppers; and
two side tubes fitted in said outer tube with each side tube

axially outward of one of said stopper means and engageable with the rubber stopper of said stopper means for limiting the relative maximum axial displacement between the inner and outer tubes.

4,811,934

HYDRAULICALLY DAMPED RESILIENT MOUNTING

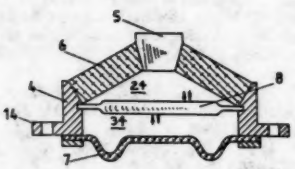
Jürgen Bebermeier; Werner Fischer; Jürgen Heitzig, all of Hanover, and Günter Eberhard, Gehrden, all of Fed. Rep. of Germany, assignors to Continental Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Continuation of Ser. No. 888,857, Jul. 23, 1986, abandoned. This application Mar. 17, 1988, Ser. No. 170,671

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1985, 3526607

Int. Cl.[4] F16M *3/00*

U.S. Cl. 267—140.1 5 Claims



1. A hydraulically damped resilient mounting, comprising:

a hollow cylindrical housing that is closed off on opposite sides by resilient elastomeric elements to form an interior of said housing; and

a partition that has an outer peripheral surface provided by a first wall having a peripheral edge and a second wall arranged so that said first wall and said second wall are spaced apart with an interior volume being located between the walls and that is disposed in said housing, between said resilient elastomeric elements, in such a way as to divide said interior of said housing into a first chamber and a second chamber, which chambers are filled with damping fluid; said partition is provided with a means for directing flow including a flow passage chamber having an interior volume in the partition, so that the volumes of said first chamber and said second chamber can be reciprocally varied via said flow passage chamber; said flow passage chamber being formed by having the interior volume in the partition being an intermediate chamber that is located in said partition and that extends within a large portion of the interior volume of said partition; said flow passage chamber also includes a slot-shaped first opening, said first opening being disposed in the surface provided by said first wall of said partition near said peripheral edge of said first wall, which first wall is adjacent to said first chamber, to provide communication between said first chamber and said flow passage chamber, and further includes a second opening, disposed axially in a central portion of said second wall of said partition, which second wall is adjacent to said second chamber, to provide communication between said flow passage chamber and said second chamber, said first and second openings being the only existing openings included with said means for directing the flow.

4,811,935

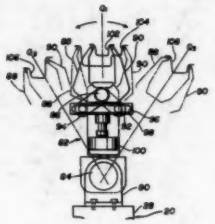
MACHINE FOR HOLDING WORKPIECE

Kinichi Tamura, Tokyo; Susumu Kawada, Kamakura; Yoshitada Sekine, Tokyo; Kazuyoshi Abe, Tokyo; Ryosuke Ishikawa, Tokyo, and Fumiki Yokota, Yamato, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Division of Ser. No. 724,577, Apr. 18, 1985, Pat. No. 4,691,905. This application Mar. 16, 1987, Ser. No. 25,975

Int. Cl.[4] B25B *27/14*

U.S. Cl. 269—34 4 Claims



1. A machine for holding a plurality of differently shaped workpieces one after another, comprising:

a manipulator with a wrist portion;

a holding unit with an axis, said holding unit including a pair of fingers pivotable about a common pin, said fingers having one end portions adapted to support a workpiece and opposite end portions;

said holding unit including a member formed with a transverse slot extending transversely with respect to said axis;

said holding unit including means fixedly connected to each of said opposite end portions of said fingers and extending through said transverse slot of said member for retaining said member in shiftable engagement with said fingers such that moving said member in one direction along said axis toward said one end portions of said fingers causes a decrease in distance between said one end portions of said fingers, while moving said member in the opposite direction along said axis away from said one end portions of said fingers causes an increase in distance between said one end portions of said fingers;

said holding unit including actuator means for moving said member along said axis; and

means for mounting said holding unit on said wrist portion, said mounting means including actuator means for angularly moving said holding unit to incline said axis from a predetermined position relative to said wrist portion of said manipulator.

4,811,936

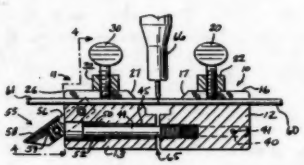
WIRE VISE

Larry A. Laymaster, P.O. Box 421, Xenia, Ohio 45385

Filed Nov. 13, 1987, Ser. No. 119,921

Int. Cl.[4] B25B *1/20*

U.S. Cl. 269—43 10 Claims



1. A device for holding two pieces of welding wire in end-

to-end butted relation while they are welded together to form a single such wire, comprising

(a) pair of metal blocks each having a longitudinal V-groove in the top thereof for receiving a piece of welding wire,

(b) means carried by each said block for releasably clamping a piece of welding wire in said groove in said block,

(c) means connecting said blocks with said grooves in aligned relation such that pieces of wire clamped therein are aligned with each other,

(d) said connecting means including means providing for relative linear movement of said blocks in line with said grooves,

(e) means including a spring carried by said blocks for continually biasing said blocks toward each other while providing for separation thereof against the force of said biasing means,

(f) whereby when two pieces of welding wire are clamped in end-to-end butted relation in the respective said grooves while said blocks are separated against the force of said biasing means and said butted ends are softened by the application thereto of welding current, said biasing means will cause said softened ends to be urged together to complete a welded connection therebetween, and

(g) means providing clearance space between the adjacent ends of said grooves for such softened metal as may increase the radial dimensions of said welded connection above the radial dimension of said wire pieces.

4,811,937

PORTABLE SURGICAL DRAINAGE PLATFORM

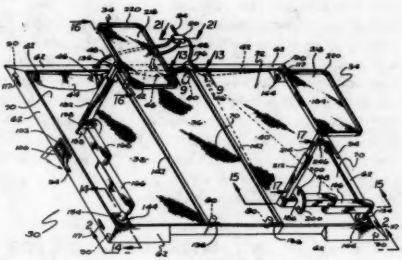
Michael L. Rothman, 440 St. Michaels Dr., Santa Fe, N. Mex. 87501

Continuation-in-part of Ser. No. 924,447, Oct. 29, 1986, Pat. No. 4,718,653, which is a continuation of Ser. No. 792,544, Oct. 29, 1985, Pat. No. 4,635,913. This application Jul. 9, 1987, Ser. No. 71,708

The portion of the term of this patent subsequent to Dec. 22, 2004, has been disclaimed.

Int. Cl.[4] A61G *13/00*

U.S. Cl. 269—327 **43 Claims**



1. A portable surgical drainage platform for collecting fluids discarded during surgical operations, said platform comprising:

a collection basin for receiving discarded fluids, the collection basin having a first portion and a second portion rotatably attached to one another, the first and second portions collectively providing the collection basin and upper non-skid surface and a fluid impermeable reservoir;

means for preventing fluid from leaking between the first and second portions of the collection basin;

means for moving the collection basin, the moving means including roller means fixed to the collection basin and extending downwardly therefrom; and

means for preventing unintended movement of the platform when the first and second portions of the collection basin are substantially horizontally aligned.

4,811,938

APPARATUS FOR COLLATING FOLDED PRINTED SIGNATURES

Egon Hänsch, Wetzikon, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

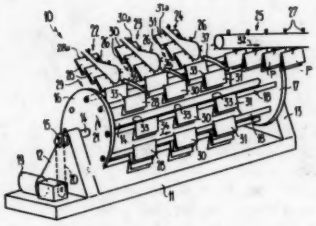
Filed Feb. 8, 1988, Ser. No. 153,584

Claims priority, application Switzerland, Feb. 11, 1987, 00510/87

The portion of the term of this patent subsequent to Aug. 4, 2004, has been disclaimed.

Int. Cl.[4] B65H *39/02*

U.S. Cl. 270—54 **13 Claims**



1. An apparatus for collating folded printed products, especially signatures, comprising:

a plurality of collating conveyors for conveying the folded printed products along a respective conveying path in straddling relationship;

means mounting said plurality of collating conveyors in substantially parallel relationship to one another and at a substantially uniform circumferential spacing from one another for revolution about an axis of revolution in a predeterminate direction;

means for rotating said collating conveyors so as to revolve about said axis of revolution;

pusher entrainment members provided for each of said collating conveyors;

a plurality of product infeed devices for delivering the printed products individually so as to repose in straddling relationship upon the plurality of collating conveyors;

each of said product infeed devices transferring the folded printed products to the collating conveyors at a predeterminate transfer location;

impact means provided at the region of the transfer location of each product infeed device in order to force the printed products against an associated pusher entrainment member; and

means for mounting each of said impact means for deflection in substantially the predeterminate direction of revolution of the collating conveyors.

4,811,939

PRINTING PLATFORM

Malcolm E. Keith, West Chicago, Ill., assignor to Midaco Corporation, Elk Grove Village, Ill.

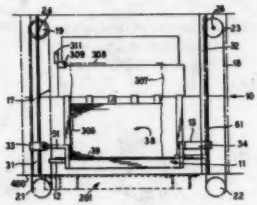
Filed Aug. 24, 1987, Ser. No. 88,591

Int. Cl.[4] B65H *1/18*

U.S. Cl. 271—146 **9 Claims**

1. A composite table for supporting sheets for a machine comprising, an outer table, vertically extending guide means slidably connected to said outer table to guide it in the vertical direction, lifting means connected to said outer table to selectively move it up or down, an inner table mounted to said outer table so as to be moveable relative thereto, a cover plate attached to said inner table, a jogging cylinder mounted between said outer and inner table, a plurality of sheets mounted on said cover plate, means for actuating said jogging cylinder, vertically extending aligning means mounted adjacent said cover plate such that said plurality of sheets engage said aligning

means when said jogging cylinder is energized so as to align first edges of said sheets, a distance sensor mounted so as to sense the position of the top sheet and to produce control signals to move said inner table relative to said outer table at right angles to the direction of movement of said jogging



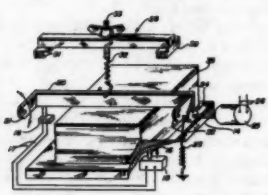
cylinder, a motor means connected to receive the output of said distance sensor and an actuating means connected to said motor means, said inner table, and said outer table such that the position of the top sheet is positioned such that the distance between said distance sensor and said top sheet is maintained constant.

4,811,940

PILE-HEIGHT BAR GOVERNOR FOR PRINTING PRESS PILE FEEDERS

Jeffrey Goeltz, 24483 Chippendale Avenue, Farmington, Minn. 55024

Filed Apr. 30, 1987, Ser. No. 44,233
Int. Cl.[4] B65H *1/18*
U.S. Cl. 271—155 **1 Claim**



1. In combination with a stock feeder for an offset printing press in which the height of a stock pile is to be maintained at a pre-determined level;

a pile-height bar comprised of lever means operable between a lower position of engagement with the top of a pile of printing stock and a raised position to permit a stock feeder to remove a sheet of stock;

first biasing means connected to and operable to urge said pile-height bar toward said lower position of engagement with the top of said pile;

second biasing means connected to and operable to reduce the force provided by said first biasing means as said pile-height bar assumes said lower position, said first and second biasing means comprising tension springs connected above and below said pile-height bar;

means, including a rotating cam means, for cyclicly operating said pile-height bar between said lower position and said raised position in synchronism with a stock feeder; and

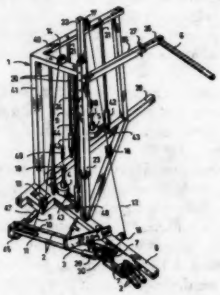
means responsive to the lower position of said pile-height bar for actuating a feed table to raise said pile of stock so as to maintain the top of said pile of stock in pre-determined relationship to said stock feeder.

4,811,941

SKATING DEVICE

Vesa Elo, Vaapelinkatu 5 A 10, SF-45130 Kouvola, Finland

Filed Aug. 22, 1986, Ser. No. 899,239
Claims priority, application Finland, Aug. 22, 1985, 853239
Int. Cl.[4] A63B *1/00, 69/18*
U.S. Cl. 272—70 **7 Claims**



1. A skating device for exercising natural skating movements comprising:

a frame having a horizontal section and vertical sections, said horizontal section serving as a base for said skating device, and said vertical sections providing a left and a right support to be gripped by the user of said skating device;

a left and a right elongated guide, each said guide having one end attached to the center of an edge of said horizontal section, and each said guide being pivotable about said attached end in a horizontal plane;

a left and a right step attached to said left and right guide respectively, each said step capable of gliding along the guide on which it is attached;

a first biasing force means for each said step, said first biasing force means acting upon said step in a direction toward said attached end of said guide;

a second biasing force means for each said guide, said second biasing force means tending to rotate said guides in opposite directions apart from one another, whereby the user of said skating device, having his left and right feet on said left and right steps respectively and gripping said left and right supports, can exercise natural skating movements by pushing outward and backward alternately with his left and right feet against the resistance provided by said first and second biasing force means.

4,811,942

PLAYGROUND UNIT HAVING GOVERNOR FOR CONTROLLING ROTATIONAL SPEED

James A. Rusk, 11322 Blue Ridge Blvd. Apt. 2, Kansas City, Mo. 64134

Division of Ser. No. 655,894, Sep. 28, 1984, Pat. No. 4,623,048.
This application Jul. 31, 1986, Ser. No. 890,923
Int. Cl.[4] A63G *1/12*
U.S. Cl. 272—33 R **15 Claims**

1. A playground unit comprising,

a vertically disposed shaft anchored in a support surface,

a horizontally disposed deck rotatably mounted upon said shaft and adapted to support at least one passenger,

a hydraulic governor for controlling the rotational speed of said deck rotating continuously in one direction,

a fluid reservoir containing hydraulic fluid and having inlet and outlet ports;

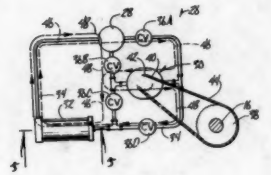
a pump on said deck having an inlet port in fluid communication with said outlet port of said reservoir and having an outlet port;

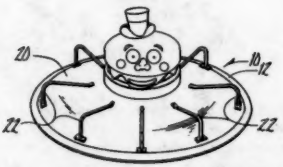
a valve housing having an internal compartment with a fluid inlet in communication with said outlet port of said pump and a fluid outlet in communication with said inlet port of said reservoir;

valve means slidably mounted within said valve housing for movement between a first open position and a second closed position;

said pump being operatively connected to said shaft such that rotation of said deck activates said pump;

said valve means moving automatically to said closed position when the rotational speed of said deck reaches a first pre-determined level; and





hysteresis means for automatically delaying the movement of said valve means from said closed position to said open position upon reduction of the rotational speed of said deck from said first predetermined level until the rotational speed of said deck is further reduced to a second pre-determined level such that the force required to maintain the rotational speed of said deck between said first and second levels is greater when said valve means is in said closed position than when said valve means is in said open position.

4,811,943

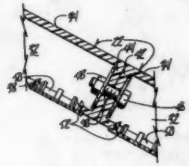
PLAYGROUND SLIDE

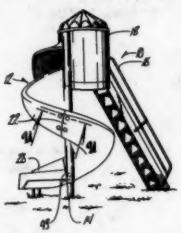
Paul W. Ahrens, Monett, Mo., assignor to Miracle Recreation Equipment Company, Monet, Mo.

Filed May 28, 1987, Ser. No. 55,431

Int. Cl.[4] A63G *21/00*

U.S. Cl. 272—56.5 R **5 Claims**





1. A playground spiral slide comprising,

a plurality of interconnected curved bedway sections,

a ground-supported post, and each of said sections including an integral sleeve portion telescopically engaging said post,

each of said bedway sections having a hollow interior construction including top, bottom, opposite side and end walls,

said interconnected hollow bedway sections including said end walls on contiguous sections being opposed and interconnected by adjustable fasteners which extend into the interior of said hollow bedway sections,

said bedway sections having the interconnected opposed end walls having access openings in one of the adjacent walls of at least one of the bed sections to provide access into the interior of the hollow bedway sections for adjustment of the fasteners, and

a cap is provided on each of said access openings to give a finished smooth appearance to said one wall and conceal said fasteners within said hollow section.

4,811,944

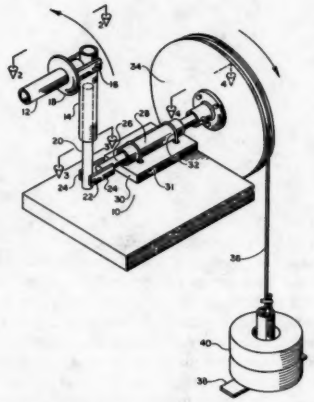
ARM EXERCISER

Ross W. Hoff, 1240 Hollyview, Vermilion, Ohio 44089

Filed Jan. 26, 1988, Ser. No. 148,642

Int. Cl.[4] A63B *23/00*

U.S. Cl. 272—67 **2 Claims**



1. An arm exercising apparatus comprising:

an elongated handle member including a hand guard and terminating at one end in a U-shape configuration, said U-shaped end including a pair of apertures in axial alignment with respect to each other;

a first elongated cylindrical sleeve member including an opening throughout its longitudinal axis, said first elongated sleeve member including a pair of apertures in opposite relationship and in axial alignment with respect to each other;

means for pivotally connecting said handle to said sleeve at a point defined by the alignment of apertures of said handle member and said first elongated sleeve member;

a first elongated rod member adapted to the telescopically inserted into said first elongated sleeve member whereby said first sleeve member is free to rotate about or move up and down along said first rod member while in use, said first rod member including an aperture therethrough at one end thereof;

a second sleeve member terminating at one end thereof in a U-shaped configuration, said U-shaped terminating end including a pair of apertures oppositely disposed and in axial alignment with respect to each other;

means for pivotally connecting said second sleeve member to said first rod member, at a point defined by the apertures located on said first rod member and said second sleeve member;

a generally elongated second rod member;

means for connecting said elongated rod member to said second sleeve member;

an elongated bearing member, adapted to rotatably receive said elongated second rod member;

a pulley member;

means for connecting said pulley member to said elongated second rod member; and,

means for attaching load means to said pulley member.

4,811,945

UNOBSTRUCTED ADJUSTABLE V-FRAME EXERCYCLE

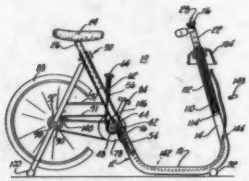
Richard A. Disbrow, Battle Creek, and Russel O. Blanchard, Marshall, both of Mich., assignors to Invacare Corp., Elyria, Ohio

Continuation of Ser. No. 326,962, Dec. 2, 1981, abandoned, which is a continuation of Ser. No. 147,028, May 6, 1980, Pat. No. 4,305,578. This application Jul. 17, 1987, Ser. No. 74,902

The portion of the term of this patent subsequent to Dec. 15, 1998, has been disclaimed.

Int. Cl.[4] A63B *69/16*

U.S. Cl. 272—73 **5 Claims**



1. An exercise apparatus comprising:

a seat assembly including a seat connected to a seat mast, said seat mast being telescopically received into a first vertical frame member and further including a means for adjusting the seat height, said seat height adjusting means including a plurality of diametrically opposed holes along the longitudinal length of the seat mast, an inboard opening spaced from an upper end of the first generally vertical portion, a V-shaped groove diametrically opposed from the opening and having inclined surfaces, said inboard opening having a periphery tjhat is tangential with the inclined surfaces of the groove, and a pin which is placed through the mast holes and nested in the vertical member's groove, the pin having a cross bar at one end to limit entrance into the slot and a spring loaded ball adjacent a second end, the ball and inboard opening being dimensioned such that the ball is biased to compress the spring as the pin is inserted through the inboard opening and engaging an exterior surface of the general vertical position to resist retraction of the pin;

handlebars;

a pedaling assembly affixed to the first vertical frame portion;

a tension control assembly for controlling pedaling effort; and,

a means for manually adjusting the height of the handlebars including:

a shaft telescopically received in a second vertical frame portion, a wedge having a diagonal cut conforming to a diagonal end of the shaft, the wedge being disposed beneath the shaft, and a knob having an elongated rod secured thereto and threaded at a lower end into a flanged nut, whereby said shaft, wedge, and knob are mounted contiguous to the handlebar assembly, the knob being manually rotated to cam the wedge into and out of a frictional locking relationship with the second vertical frame portion for selectively locking the handlebars and shaft against vertical movement and for releasing the shaft to enable the handlebars to be shifted vertically, whereby the height of the handlebars is readily adjustable by a user sitting on the seat.

4,811,946

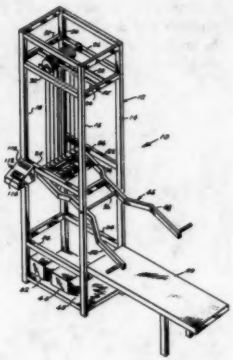
WEIGHT LIFTING APPARATUS

Stanley J. Pelczar, 259 Woodmont Dr., East Hartford, Conn. 06118

Filed Mar. 18, 1988, Ser. No. 169,935

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—129 **14 Claims**



1. Weight lifting apparatus comprising:

rigid support frame means;

a plurality of spring loaded tension units mounted on said support frame means, each of said tension units including a pre-determined length of cable;

lifting frame means pivotally mounted on said support frame means and connected to said pre-determined length of cable from each of said spring loaded tension units;

selection means for selecting a lifting weight, said selection means selectively engaging said pre-determined length of cable from at least one spring loaded tension unit, said selection means being operatively connected to said lifting frame means; and

control means for controlling and actuating said selection means.

4,811,947

VIBRATION ABSORBER FOR A RACKET

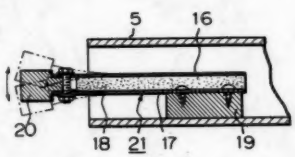
Masanori Takatsuka, and Yoshinori Hariguchi, both of Shizuoka, Japan, assignors to Yamaha Corporation, Japan

Filed Feb. 18, 1987, Ser. No. 15,941

Claims priority, application Japan, Feb. 19, 1986, 61-034180; Feb. 19, 1986, 61-034181

Int. Cl.[4] A63B *49/08*

U.S. Cl. 273—73 J **3 Claims**



2. A vibration absorbing racket including a racket head and a straight end section supporting said racket head, said vibration absorbing racket comprising a visco-elastic member including first and second substantially parallel elongated faces, mounting means for said visco-elastic member within said straight end section of said racket, elongated securing means mounting said visco-elastic member, said elongated securing means including a first end and a second end, said first end of

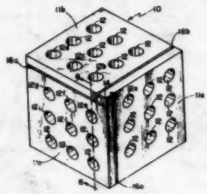
said elongated securing means being fixedly mounted with respect to said visco-elastic member and said straight end section of said racket and said second end of said elongated securing means being substantially freely movable in response to vibrations applied to said racket head, said elongated securing means including first and second elongated leaf spring members mounted on said first and second elongated faces of said visco-elastic member, respectively, whereby said visco-elastic member is sandwiched therebetween, and mass means affixed to said second end of said elongated securing means whereby said vibrations applied to said racket head are substantially dampened by said visco-elastic member and said movement of said second end of said elongated securing means in response to said vibrations applied to said racket head.

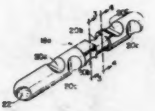
4,811,948

CUBE AND PEGS ASSEMBLY PUZZLE

J. Guadalupe Gutiérrez, Veracruz 516, Aguascalientes, Ags 20070, Mexico

Filed Feb. 29, 1988, Ser. No. 161,744
Int. Cl.[4] A63F *9/12*
U.S. Cl. 273—156 **4 Claims**





1. A puzzle game comprising:

a body portion having two or three sets of holes, the said sets of holes disposed perpendicularly respect to each other, said sets of holes intersecting sideways each other, and

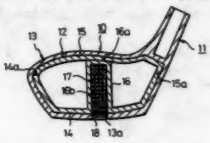
a number of pegs made for the purpose of being inserted into the said holes, the said pegs having notches to allow insertion of two or three of the said pegs into the said body portion without blocking each other's way even when sharing a common intersection, each of the said pegs being rotatory inside the said body portion so insertion of new said pegs will be blocked if said notches do not match said common intersection, the said pegs having a round cross section, each of the said pegs having three pairs of said notches along itself, the arrangement of notches respect to each other in any one of the said pairs is such that going from any end of the peg to the other, the second notch met in any of the three pairs of notches is rotated 90 degrees in the peg's longitudinal axis respect to the first notch met, the said 90 degree rotation being either clockwise or counter-clockwise for all the said pegs, but never both, the two respective notches in each of the extremes of the said pegs facing in same direction and the notches in the middle pair respectively facing in two directions which are opposite to the directions in which the notch pairs at the extreme of the pegs face, the said pegs having a smaller cross section along the middle pair of notches, all the said smaller cross sections being round for a group of said pegs, half of the smaller cross section being round and the other half being square for another group of said pegs, the said smaller cross sections being provided as means to allow rotation of either one or two pegs when these two pegs meet each other, inside the said body portion, at their respective smaller cross sections.

4,811,949

CONSTRUCTION OF A CLUB-HEAD FOR A GOLF CLUB

Masashi Kobayashi, Matsudo, Japan, assignor to Maruman Golf Co., Ltd., Tokyo, Japan

Filed Sep. 21, 1987, Ser. No. 99,461
Claims priority, application Japan, Sep. 29, 1986, 61-228466
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—171 **5 Claims**



1. A golf club head comprising:

a hollow outer shell forming the outer contour of said golf club head, said hollow outer shell being provided with a first opening;

a hollow inner shell in said outer shell with no substantial clearance therebetween, said hollow inner shell being composed of first and second cup-shaped halves secured to each other, one of said first and second cup-shaped halves having a hollow projection from a second opening in said one of said cup-shaped inner shell halves, at a position corresponding to said first opening in said outer shell, toward and abutting against an inner opposing surface of the other of said inner shell halves and forming a reinforcement between said inner shell halves;

a weight adjusting means for adjusting the weight of said club head within said hollow projection; and

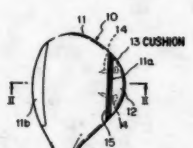
closure means in said first and second openings for retaining said weight adjusting means within said hollow projection.

4,811,950

GOLF CLUB HEAD

Masashi Kobayashi, Matsudo, Japan, assignor to Maruman Golf Co., Ltd., Tokyo, Japan

Filed Jul. 27, 1987, Ser. No. 77,929
Claims priority, application Japan, Jul. 31, 1986, 61-178923
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—171 **11 Claims**



1. A head of golf club comprising:

a head body having a front surface forming a hitting surface of said head for hitting a ball, said head body also having a cut-off surface other than said front surface;

a fitting member for adjusting a least the weight of said head, said fitting member being engagable with said cut-off surface of said head body to form an outer surface portion

continuous with said head body but other than said front surface thereof, said fitting member being made of a material different from that of said head body;

a cushion member made of a resilient material and disposed along an entire contact area between said cut-off surface of said head body and said fitting member; and

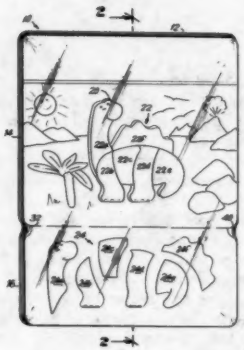
means for securing said head body, cushion member and fitting member so as to form an integral club head.

4,811,951

PUZZLE INCLUDING PIECES FORMED FROM A CRAYON MATERIAL

Denise Dorsey-Zinn; Sue M. Meiser, and Michael F. Cassidy, all of Lafayette, Ind., assignors to Random House, Inc., New York, N.Y.

Filed May 12, 1988, Ser. No. 193,012
Int. Cl.[4] A63F *9/10*
U.S. Cl. 273—157 R **11 Claims**



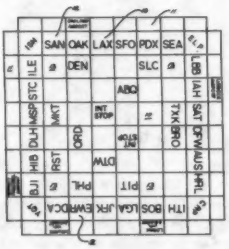
1. A puzzle comprising a frame having a recessed portion formed therein, a first plurality of puzzle pieces formed from a crayon material and adapted to be selectively, removably arranged in a predetermined pattern in said recessed portion to complete said puzzle, and a second plurality of puzzle pieces adapted to be selectively, removably arranged in said predetermined pattern in said recessed portion after said first plurality of puzzle pieces are removed to complete said puzzle.

4,811,952

FLIGHT DESTINATION BOARD GAME

Stanley J. Dzik, 6837 Harriet Ave. S., Richfield, Minn. 55423

Filed Apr. 27, 1983, Ser. No. 489,156
Int. Cl.[4] A63F *3/02*
U.S. Cl. 273—258 **10 Claims**



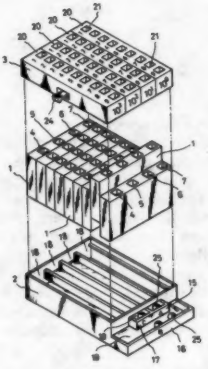
1. Game apparatus for flight destination play by opposing players, consisting of a playing board and two sets of movable markers, each said set including a single destination marker, a flight marker, and a plurality of offensive-defensive markers representing air vehicles, with all markers of one said set visually distinct from all markers of the other said set, said board comprising a playing field of landing sites equally spaced one from the other in an array of north-south and east-west rows, said outermost east-west rows at opposing ends of said board being base rows and the immediately inward east-west rows parallel and adjacent to said base rows being secondary rows, each said opposing base row having one landing site adapted to receive a said flight marker at the start of play, all other landing sites of the base row and of the secondary row at the same end of said board being adapted to receive offensive-defensive markers of the same set as said flight marker at said end at the start of play, airport indicia on each said base row landing site, a destination marker site outwardly adjacent each said airport indicia base row landing site for elective placement of the destination marker of the player whose flight marker is at the opposing end of said board at the start of play, and means consisting of two visually distinct diagonally adjacent landing sites medially located on said board between said secondary rows for allowing a player whose predetermined marker occupies either of said visually distinct landing sites during play to change the initially elected placement of said player's destination marker and thereby shift the flight destination of said player's flight marker.

4,811,953

NUMBERING GUESSING GAME STRUCTURE

Horng-tsair Jeng, 1Fl., No. 12, Alley 81, Lane 222, Huu Lin St., Taipei, Taiwan

Filed Oct. 23, 1987, Ser. No. 112,248
Int. Cl.[4] A63F *3/00, 7/00*
U.S. Cl. 273—265 **2 Claims**



1. A "figure-guessing" game comprised of a plural number of balls, a top plate, several separate case types, a base and a gate, wherein each case type includes plural entrance openings, plural exit openings, and several internal paths permitting the passage of balls from the entrance openings to exit-openings, the passages of balls from selected entrance openings to selected exit openings being different from case type to case type;

all said cases having identical outer appearances, differing only internally in the structure of the ball paths;

said base comprising three isolated ball output regions A, B and C which are labelled differently for distinction and removal of the balls;

said top plate comprising plural holes arranged in plural rows, each row including several holes; the rows and

holes being labeled with numeral symbols which can represent many numbers;

said gate comprising a movable plate under the top plate for controlling the opening and closure of all holes in the top plate;

wherein the cases are randomly arrangable on said base; said top plate being positioned on the cases so that the entrance openings in each case will connect the various holes on the top plate with different output regions in the base depending on where the cases are arranged on the base.

4,811,954

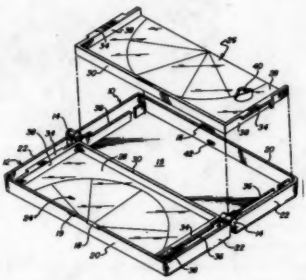
FOLDING CASE AND GAME BOARD ASSEMBLY

Ronald S. Hemmann, Newington, Conn., assignor to Coleco Industries, Inc., West Hartford, Conn.

Filed Jan. 6, 1988, Ser. No. 142,808

Int. Cl.[4] A63F *3/00*

U.S. Cl. 273—283 **12 Claims**



1. A portable game assembly comprising:

(a) a foldable container comprised of a pair of tray elements, hinge means along one side margin of said tray elements joining said tray elements for movement from a closed, overlying position to an open position wherein said tray elements lie in a common plane, and latch means for securing said tray elements in said closed position, said tray elements providing recesses therewithin; and

(b) a pair of elongated game board elements removably seated within respective recesses of said tray elements, said game board elements being removable from said recesses in said open position and rotatable 90° into a second position in which they seat on both tray elements and bridge the hinge line defined by said one side margin of the tray elements and seat in the recesses of both trays to rigidify said container in said open position.

4,811,955

HAND FIRE-ARM FOR SHOOTING WITHOUT AMMUNITION

Carlo De Bernardini, 8, Rue des Maraichers, 1205 Geneva, Switzerland

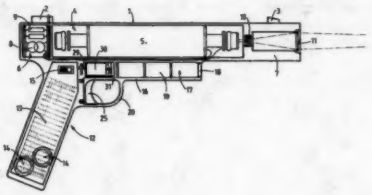
Filed Sep. 21, 1987, Ser. No. 98,874

Claims priority, application Switzerland, Sep. 29, 1986, 3887/86

Int. Cl.[4] A63B *67/00*; F41G *3/26*; F41C *19/12*

U.S. Cl. 273—310 **3 Claims**

1. A dummy hand fire-arm emitting a laser beam of short duration, comprising a pistol having a sighting device and housing a laser tube, the laser tube having a firing device having a high voltage portion and an optical focusing device for the laser beam, the pistol having a hand grip housing an electronic control means of the laser as well as an electro-mechanical triggering device for the beam, said triggering device comprising a trigger pulled by a finger of the user of the fire-arm, and means yieldably to resist pulling the trigger, said resisting means comprising a membrane which is displaceable



and which acts against movement of the trigger to augment the pull of the trigger.

4,811,956

HOLDER FOR TARGET PATTERN PAPER

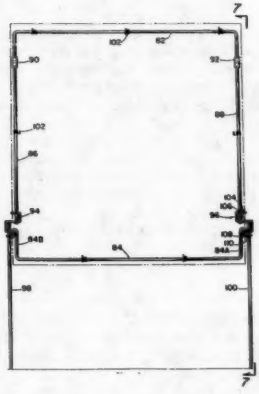
Howard R. Foreman, Rte. 1, Box 110A, Miami, Okla. 74354

Continuation-in-part of Ser. No. 759,332, Jul. 26, 1985, Pat. No. 4,637,615. This application Nov. 24, 1986, Ser. No. 934,030

The portion of the term of this patent subsequent to Jan. 20, 2004, has been disclaimed.

Int. Cl.[4] F41J *1/10, 1/00*; F16D *1/00*

U.S. Cl. 273—407 **6 Claims**



1. A holder for pattern paper comprising:

a rectangular frame including an upper bar, a first side bar and a second side bar, a bottom section with a hook member at each end thereof;

a first and second screwless clamping means to clamp said upper bar to said side base respectively;

leg means;

two bottom unitary clamp means each for receiving the lower end of one of said two side bars and for also receiving the hook member on one of said bottom section, said bottom clamp means each having two axially aligned holes laterally offset from the side bar's longitudinal axes for receiving saidleg means such that said leg means are not aligned with said side bar;

hooks extending from said upper bar and said bottom section;

a rectangular target base having holes therein matching the hooks on said upper bar and said bottom section so that the target base can be secured to the holder.

4,811,957

DEVICE FOR ACCOMPLISHING AT LEAST A LIQUID TIGHT JOINT AND A METHOD FOR MANUFACTURING SUCH A DEVICE

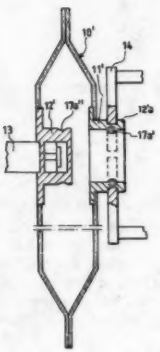
Magnus Bergström, Bjärred; Per-Stefan Gersbro, and Jan-Olof Fransson, both of Lund, all of Sweden, assignors to AB Akerlund & Rausing, Sweden

Filed Dec. 1, 1987, Ser. No. 127,489

Claims priority, application Sweden, Dec. 11, 1986, 8605318

Int. Cl.[4] F16J *15/14*; B29F *1/00*

U.S. Cl. 277—1 **11 Claims**



1. In a device for forming an at least liquid tight joint between two elements, comprising a sealing portion arranged in at least one of said elements, said sealing portion forming said joint in an area intended for abutment of said elements when said elements are brought together in said abutment area, the improvement:

that said sealing portion comprises a seal manufactured by sequential injection moulding technique integral with at least a region of said element directly adjacent to said sealing portion, for forming a molecular bond between said seal and said region, and

that said seal of of a relatively softer material than said adjacent region.

4,811,958

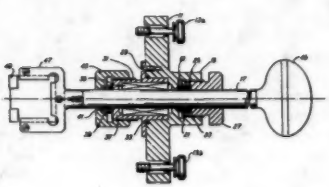
SEALED SHAFTS MOVEABLE IN VACUUM CHAMBERS BY EXERCISING CONTROL FROM OUTSIDE

George Katz, Ossining, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 46,599, May 7, 1987, abandoned. This application Jun. 16, 1988, Ser. No. 207,907

Int. Cl.[4] F16J *15/40*

U.S. Cl. 277—12 **14 Claims**



1. Apparatus for maintaining an evacuated chamber sealed against surrounding environment, said apparatus including a member with an aperture through it, a tube-like element connected to said member with a first passage extending from said aperture on a first side thereof, a shaft passing through said first passage, a first sealing means between said tube-like element and said shaft sealing said first passage against surrounding environment, a second passage remote from said first passage, said shaft passing through said second passage, and second sealing means cooperating with said shaft and sealing said second passage against surrounding environment, said shaft being movable linearly through said first and second sealing means and having the same cross-sectional area throughout its length which moves linearly through said sealing means.

4,811,959

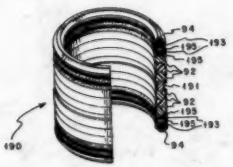
SEAL ASSEMBLY FOR WELL LOCKING MANDREL

Roy P. Bullard, Grand Prairie, and Russell I. Bayh, III, Carrollton, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Nov. 27, 1987, Ser. No. 126,039

Int. Cl.[4] F16J *15/20*

U.S. Cl. 277—124 **8 Claims**



7. A seal assembly for use on downhole well tools which require a sliding fluid barrier comprising:

a. a center element;

b. v-rings having asbestos yarn impregnated with an elastomer disposed on opposite sides of the center element;

c. wire mesh rings adjacent to the v-rings;

d. the center element comprising an o-ring having asbestos yarn impregnated with an elastomer;

e. the wire mesh rings comprising alternating layers of wire mesh and flexible graphite; and

f. the asbestos yarn having wrapping selected from the group consisting of tetrafluorethylene-propylene copolymer and tetrafluorethylene-propylene terpolymer.

4,811,960

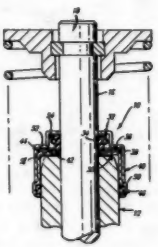
FIXED VALVE STEM OIL SEAL

Bernard G. Stritzke, Hanover Park, and Brian F. Rericha, Downers Grove, both of Ill., assignors to Microdot Inc., Darien, Conn.

Filed Aug. 10, 1987, Ser. No. 85,745

Int. Cl.[4] F16J *15/32*

U.S. Cl. 277—153 **3 Claims**



1. A fixed valve stem oil seal comprising

a cup-shaped inner case engageable with a valve guide of a piston-type internal combustion engine, said inner case

having an upper radially extending flange with a central aperture for the acceptance of a valve stem,

a cup-shaped outer case telescoped over said inner case in nesting relationship and having a radially extending flange disposed in spaced relation to the flange on said inner case, and

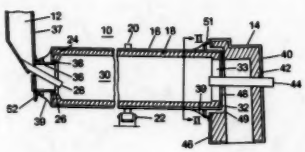
a seal element disposed between the radial flanges on said inner and outer cases and radially movable relative thereto, said seal element having a first sealing surface engageable with the valve stem and a second washer-like sealing surface engageable with the radial flanges on said cases so as to effect a seal between said valve and said valve guide, said inner case having means engageable with said outer case to limit said nesting relationship so as to maintain a constant gap between said radial flanges on the inner and outer cases which allows the washer-like sealing surface to move radially therebetween to accommodate misalignment of a valve associated with said valve guide while maintaining a constant seal.

4,811,961

SEAL FOR ROTATING CYLINDERS SUCH AS KILNS AND THE LIKE

John T. Williams, Wauwatosa, Wis., assignor to Boliden Allis, Inc., Milwaukee, Wis.

Filed Apr. 8, 1988, Ser. No. 179,080
Int. Cl.[4] F16J *15/32*
U.S. Cl. 277—199 **13 Claims**



1. An apparatus comprising in combination a stationary member and a rotating cylinder telescopically arranged in said stationary member and said cylinder coacting with said stationary member to define an annular opening therebetween, and a seal circumscribing said cylinder adjacent said stationary member and closing said annular opening, said seal comprising:

a series of leaf members attached to said stationary member and extending outwardly toward and being self-biased into engagement with the outer surface of said rotating cylinder, said leaf members being circumferentially spaced and partially overlapping to form a continuous surface to completely cover the annular opening between said rotating cylinder and said stationary member,

a series of flexible blanket members attached to said stationary member and extending toward said cylinder and positioned adjacent said leaf members, said blanket members being circumferentially spaced to cover the overlapping edges of adjacent leaf members to improve the sealing effect between the interior of said rotating cylinder and atmosphere.

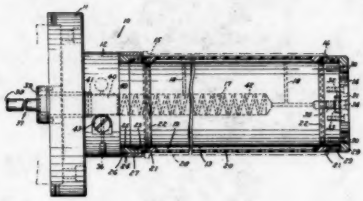
4,811,962

HOLDER FOR MACHINING THIN WALLED CYLINDER

G. N. Cameron, Jr., 873 Briar Ct., Rochester, Mich. 48063

Filed Nov. 23, 1984, Ser. No. 674,413
Int. Cl.[4] B23B *5/22*; B23Q *3/08*
U.S. Cl. 279—2 A **14 Claims**

1. Holder for finish machining thin walled cylindrical workpiece hydraulically actuated with minimum workpiece deflection from initial out-of-round free state characterized by rigid cylindrical body, relatively thin walled flexible plastic cylindrical sleeve held by said body, means for introducing actuating hydraulic fluid between said sleeve and body to effect sleeve displacement into workpiece holding engagement, and relatively thick annular extremities of said sleeve engaging said cylindrical body on either side of said thin sleeve wall with



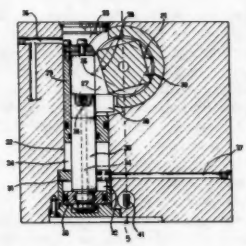
annular sealing means interposed between adjacent cylindrical surfaces of said thick extremities and said rigid cylindrical body to retain said actuating hydraulic fluid against leakage.

4,811,963

AUTOMATIC INDEXING CHUCK FOR ANGULAR STEP-BY-STEP MOVEMENT OF JAWS

Walter Bronzino, and Pier M. Bronzino, Both of Caprie, Italy, assignors to Autoblok S.p.A., Caprie, Italy

Filed Jun. 29, 1987, Ser. No. 68,487
Claims priority, application Italy, Jul. 4, 1986, 67538 A/86
Int. Cl.[4] B23B *31/18*
U.S. Cl. 279—5 **19 Claims**



1. An automatic indexing chuck including clamping jaws, for angular step-by-step movement of said clamping jaws, comprising:

a chuck body;

a dividing pivot for supporting at least one of said clamping jaws;

a locking member having retention faces for locking said dividing pivot against rotation thereof about a pivoting axis;

a dividing shaft having a portion engageable with said dividing pivot to cause it to rotate about said pivoting axis;

a first cavity formed in said chuck body for accommodating said locking member and said dividing shaft for reciprocal movement thereof;

two adjacent chambers defined by said first cavity;

two reciprocating pistons defined by said locking member and said dividing shaft, said pistons being sealingly movable within said adjacent chambers of said first cavity;

fluid conducting means extending between said adjacent chambers for continuously putting them into fluid flow communication;

a first hydraulic circuit including a source of fluid under pressure and inlet and outlet ports reversibly and selectively connectable to said adjacent chambers of said first cavity;

said hydraulic circuit, upon alternatively reversing said inlet and outlet ports, providing fluid under pressure to cause said

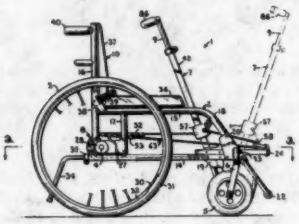
locking sleeve and said dividing shaft to continuously move in opposite directions for consecutively unlocking, rotating and locking of said dividing pivot.

4,811,964

WHEELCHAIR PROPELLED BY ROWING

Douglas J. Horn, 12813 Saint Andrew Dr., Kansas City, Mo. 64145

Filed Sep. 25, 1987, Ser. No. 100,902
Int. Cl.[4] B62M *1/16*
U.S. Cl. 280—250.1 **24 Claims**



1. A wheelchair propelled by rowing action comprising:
(a) a wheelchair frame with a wheelchair seat;
(b) a pair of laterally spaced main rear wheels affixed to an axle, said axle being rotatably mounted on said frame;
(c) at least one steerable front wheel rotatably mounted on a front wheel bracket pivotally connected to said frame;
(d) elongated rowing lever means pivotally connected to said frame such that said rowing lever means is capable of reciprocal pivoting movement about a lateral axis of said frame, said lever means including a handle;
(e) motion transfer means drivingly engaged between said lever means and said axle such that pivoting motion of said lever means in opposite directions is converted to rotary motion in a single direction which is transferred to said axle to thereby propel said vehicle in a forward direction of said wheelchair;
(f) disengageable clutch means coupled between said motion transfer means and said axle and operable when disengaged to cause the slippage of said motion transfer means about said axle in both clockwise and counterclockwise directions;
(g) said handle being pivotably to thereby pivot said rowing lever means about a longitudinal axis of said rowing lever means;
(h) steering link means operatively connected between said rowing lever means and said front wheel bracket such that pivoting said lever means about said longitudinal axis thereof causing pivoting of said front wheel bracket whereby said vehicle is steered; and
(i) said rear wheels being sized and said axle being positioned on said frame directly adjacent to and on opposite sides of said seat to allow propulsion of said wheelchair by an occupant thereof upon disengagement of said clutch means by said occupant manually rotating said rear wheels.

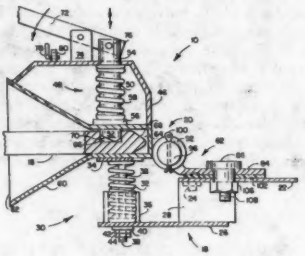
4,811,965

VEHICLE HITCH

Hubert M. Eubanks, R.F.D. 1, Box 154, Lafayette, Ala. 36862

Filed Jul. 22, 1987, Ser. No. 76,347
Int. Cl.[4] B60D *1/22*
U.S. Cl. 280—455.1 **12 Claims**

1. A hitch for connecting a first vehicle to a second vehicle, said hitch comprising a support member, means for securing said support member to one of said vehicles, a coupling member for receiving a coupling tongue which is connected to the other vehicle, said hitch including first pivot means operatively coupling said support member and said coupling member for providing movement of said coupling member in a generally horizontal plane and second pivot means for providing movement of said coupling member in a generally vertical plane, attachment means for attaching said coupling tongue to said coupling member, and shock absorber means operatively disposed between said coupling member and said support



member for absorbing shock during movement of said coupling member relative to said support member, said first pivot means including variable friction means for variably resisting movement of said coupling member in said generally horizontal plane, and manually adjustable means for adjustably varying the movement resistance of said friction means so as to reduce and damp sway or yaw tendency of a towed vehicle.

4,811,966

KERB CLIMBING DEVICE

John M. Singleton, Solihull, England, assignor to The Spastics Society, London, England

Filed Jan. 4, 1988, Ser. No. 140,724
Claims priority, application United Kingdom, Jan. 13, 1987, 8700686
Int. Cl.[4] B62B *9/02*
U.S. Cl. 280—5.32 **20 Claims**

1. A kerb climbing device for use with a wheelchair having laterally spaced, opposed sides and at least one ground engaging wheel of relatively small diameter, said device comprising an axially telescopic guide arm adapted to be mounted on the wheelchair to extend forwardly of the small diameter wheel for locating a kerb in an operative position of said device and an axially rigid lifting arm adapted to be mounted on the wheelchair to extend forwardly of the small diameter wheel above said guide arm in said operative position of said device and pivotal in response to engagement of said guide arm with the kerb to engage the kerb and lift the small diameter wheel off the ground.

4,811,967

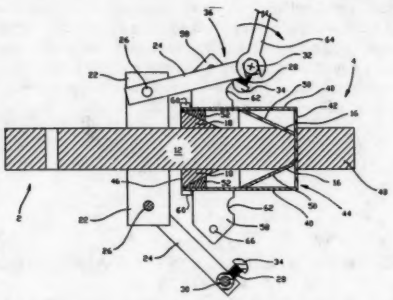
TRAILER HITCH

James C. Hensley, R.R. 2, Box 150, Centralia, Ill. 62801

Continuation-in-part of Ser. No. 819,590, Jan. 17, 1986, Pat. No. 4,722,542, which is a continuation-in-part of Ser. No. 692,398, Jan. 18, 1985, abandoned. This application Sep. 2, 1987, Ser. No. 92,083

Int. Cl.[4] B60D 1/14

U.S. Cl. 280—479.3 20 Claims



1. A trailer hitch comprising: a hitch bar having a shank and beveled surfaces located along the shank; a hitch box including box-like enclosure having an open end through which the shank of the hitch bar projects and also having beveled surfaces which conform to and bear against the beveled surfaces along the shank, the inclination and arrangement of the beveled surfaces on the shank and within the enclosure being such that when the beveled surfaces of the shank are seated against the beveled surfaces of the enclosure, the hitch box cannot move laterally with respect to the hitch bar; and an over center clamp connected to the hitch bar and to the hitch box and urging the two together such that the beveled surfaces on the hitch bar seat against the beveled surfaces on the hitch box, the over center clamp having elements which pivot relative to each other and relative to the hitch bar and hitch box as well, from a position in which they permit the shank to shift within the enclosure and the beveled surfaces on each to separate, to a center position in which the axes about which the elements pivot are essentially aligned side-by-side and the elements urge the beveled surfaces on the shank and enclosure snugly together, to an over center position slightly beyond the center position wherein the beveled surfaces remain snugly together.

4,811,968

COLLAPSIBLE CART

Ronald J. Bolden, Houston, Tex., assignor to USEC, Inc., Winchester, Va.

Filed Apr. 7, 1988, Ser. No. 178,559

Int. Cl.[4] B62B 1/04

U.S. Cl. 280—652 1 Claim

1. A collapsible cart comprising a base;

a transverse axle shaft connected to the base adjacent one end thereof and mounting a pair of wheels;

a collapsible basket of rectangular shape overlying, mounted upon and removably secured to the base and positioned between said wheels;

a handle socket forwardly of the other end of said base and secured thereto;

a formed central handle having one end portion aligned with and removably nested and secured within said socket, with its other end projecting forwardly, said one end portion providing an upright central support for the cart;

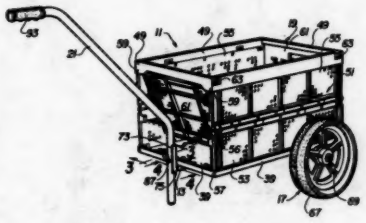
said basket including a rectangular bottom wall including opposed sides and ends, a plurality of spaced longitudinal ribs connecting said ends; and

a plurality of transverse ribs connecting said sides;

said base including an elongated base plate centrally underlying and supporting said bottom wall;

a plurality of fasteners inter-connecting said bottom wall and base plate;

an elongated stiffener channel centrally underlying and connected to said base plate;



said axle shaft extending transversely through said channel adjacent one end and secured thereto;

there being a plurality of longitudinally spaced and transverse slots formed in said base plate and channel cooperatively receiving the transverse ribs, said channel receiving one of said longitudinal ribs.

4,811,969

APPARATUS FOR CONTROLLING A STEERING ANGLE OF A REAR WHEEL

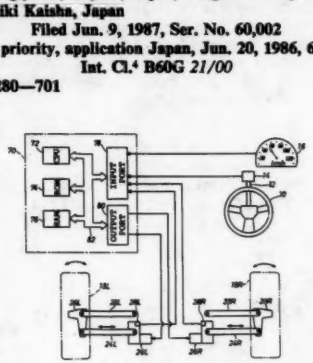
Mizuho Sugiyama, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jun. 9, 1987, Ser. No. 60,002

Claims priority, application Japan, Jun. 20, 1986, 61-145819

Int. Cl.[4] B60G 21/00

U.S. Cl. 280—701 5 Claims



1. Apparatus for controlling steering angles of right and left rear wheels comprising:

means for detecting a vehicle speed and a steering angle of a front wheel;

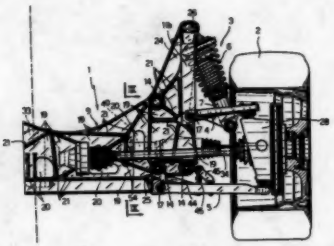
means responsive to said detecting means for controlling a toe-in quantity of said rear wheels in relation to said vehicle speed and steering angle of said front wheel during high speed turning, said apparatus including means for increasing the toe-in quantity in accordance with an increase of said vehicle speed and said steering angle of said front wheel.

4,811,970

FRONT FRAME FORMING PART OF A SUPPORTING STRUCTURE OF A MOTOR VEHICLE

Ferdinando Cassese, Modena, Italy, assignor to Ferrari Engineering S.p.A., Modena, Italy

Filed Jun. 16, 1988, Ser. No. 207,643
Claims priority, application Italy, Jun. 16, 1987, 67510 A/87
Int. Cl.[4] B62D *27/04*
U.S. Cl. 280—788 **10 Claims**



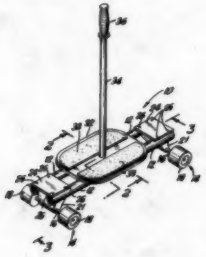
1. A front frame forming part of a supporting structure of a motor vehicle and resiliently connected to a central frame of the said structure to support the passenger compartment of the motor vehicle, the said front frame being connected resiliently to each front wheel (2) of the motor vehicle by means of a resilient suspension (3), the said central frame including a pair of parallel attachment beams (8) projecting from the frame itself in the direction of the longitudinal axis thereof and the said front frame including a plate (9) adapted to be carried at the ends of the said beams and at least two pairs of first arms (11, 12) substantially orthogonal to the said plate and engaging on the outer lateral surfaces of the said beams, the said front frame being fixed to the said beams by means of two first series of three sleeves (14) made of resilient material and disposed on each side of the plate and two second series (15) of two sleeves connecting each pair of arms to the corresponding beam, characterised by the fact that the said plate includes a substantially flat wall (19) in which are formed perforations (20) and from which project a plurality of ribs (21) to form a flat reticular structural element, and by the fact that the sleeves (14) of the said first series are disposed in correspondence with nodes of the said reticular structural element.

4,811,971

RIDE-ON VEHICLE

Charles B. Phillips, 180 West. End Ave., New York, N.Y. 10023

Filed May 22, 1987, Ser. No. 52,913
Int. Cl.[4] A63C *17/02*
U.S. Cl. 280—87.041 **1 Claim**



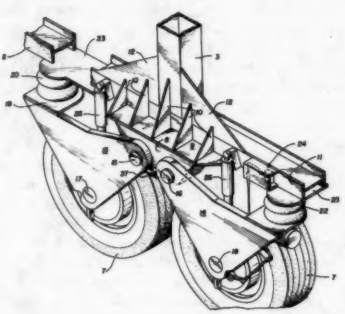
1. A ride-on vehicle comprising a vehicle frame, said frame including a tubular structure made up of a pair of parallel tubular members lengthwise thereof and spaced apart mounting plates disposed at each of the opposite ends of the tubular members and connecting said tubular members to each other, said mounting plates also having support brackets facing downwardly from the tubular members, wheel assemblies mounted on the downwardly facing portion of said mounting members and wheels disposed therein, a footplate of oval configuration rigidly mounted on and projecting upwardly from said frame the said tubular members and centrally located thereon, a control stick mounted centrally through said oval footplate and rigidly connected to each of said tubular members and projecting upwardly from said oval footplate for aiding the user in maintaining balance and keeping control of said ride-on vehicle, and said control stick being independent of both of said wheel assemblies.

4,811,972

REAR WHEEL SUSPENSION SYSTEM FOR STRADDLE CARRIERS

James G. Wiley, Jr., Yakima, Wash., assignor to Comet Trailer Corp., Selah, Wash.

Filed Sep. 15, 1987, Ser. No. 96,441
Int. Cl.[4] B60G *5/02*
U.S. Cl. 280—683 **2 Claims**



1. In a straddle carrier having laterally separated rear tandem wheel pairs, wheel suspension units for each tandem wheel pair, each suspension unit comprising a vertical support frame depending from a lower longitudinal frame member of the carrier, a pair of axle mount plates, one end of each axle mount plate being pivotally connected to said support frame on a transverse axis, one axle mount plate extending in a direction forwardly of the carrier and the other axle mount plate extending in a direction rearwardly of the carrier, an air spring interposed the opposite end of each axle mount plate and the lower longitudinal frame member of the carrier, shock absorbers mounted between the axle mount plates and lower longitudinal frame member of the carrier, to thereby control the jounce of the axle mount plates and air springs, and wheel axle assemblies secured to the medial portion of each axle mount plate and positioned between said one end of the axle mount plate and said air spring in a plane below the transverse pivotal axis and the air spring, whereby the rear tandem wheels are independently pivotal about the transverse axis, and a stop member secured to the vertical support frame between the axle mount plates in proximity to the transverse axes and engageable by the axle mount plates, to thereby limit the downward movement of the axle mount plates, whereby damage to the air springs is prevented.

4,811,973

BOUND BOOK WITH BOUND HOLDER CARRYING LOOSE-LEAF PAGES

Victor Kumar-Misir, 33 Burnview Cresc., Scarborough, Ontario, Canada M1H 1B4

Filed Mar. 9, 1987, Ser. No. 23,357
Claims priority, application Canada, Mar. 25, 1986, 505085
Int. Cl.[4] B42D *1/00, 1/06;* **G09B** *17/02;* **B42F** *13/00*
U.S. Cl. 281—21 A **12 Claims**

1. A book comprising:
(a) a cover,
(b) a set of thin question pages and a set of thin answer pages,
(c) said set of question pages containing question material printed thereon for marking an answer page,
(d) each answer page containing matter printed thereon to be marked in accordance with questions in said question pages,
(e) a holder, said holder being a single flat thin sheet of material,
(f) a single substantially permanent-binding member, said binding member being connected directly between said cover, said question pages and said holder, for said single binding member permanently to secure both said question pages and said holder to said cover,
(g) each answer page having a margin portion having holes pre-formed therein, and
(h) securing means releasably securing said answer pages to said holder so that when said answer pages have been used, they can be removed and replaced by fresh answer pages, said securing means comprising a readily removable fastening member of small thickness connected to said holder and extending through said holes.

4,811,974

METHOD OF INDEXING A DICTIONARY AND THE INDEX SYSTEM THEREOF

Wan-Lan Ho, 1st Fl., No. 4, Lane 112, Sec. 2, Hsiu Ming Rd., Mucha, Taipei, Taiwan

Continuation of Ser. No. 714,029, Mar. 20, 1985, abandoned. This application Oct. 5, 1987, Ser. No. 105,521
Int. Cl.[4] B42D *15/00;* **B42F** *21/00, 21/04*
U.S. Cl. 283—67 **8 Claims**

1. A method of indexing a dictionary and an indexing system thereof comprising the steps of:
dividing the fore edge of a dictionary into a plurality of indexing areas with a predetermined space for each area;
diagonally marking the twenty-six English letters in alphabetical order on the fore edge of an upper indexing area of said indexing areas according to the pages covering entries that have the same first letter similar to the one marked on their fore edges and at a location intersected by the coordinates thereof;
marking the five English vowels A, E, I, O and U on the fore edge of a lower indexing area of said indexing areas and at the locations longitudinally corresponding to the same vowel letters marked in said upper indexing area thereof;
designating a plurality of labelling means for respectively denoting the second letter of each entry covered by a region marked on the fore edge with the letter of the alphabet;
separately labelling said labelling means on the fore edge of said upper indexing area and at each region covering entries that have the same second letter in (vowel) both vowel and consonant, and on the fore edge of said lower indexing area at the region covering entries that have the same second letter in (consonant) vowel; and respectively labelling a same one of said labelling means in said index-

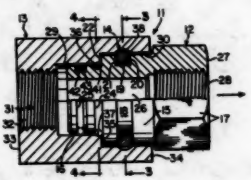
ing areas to separately represent the third letters of those entries whose first and second letters appear in more pages therein; so that, by referring to the marking of letters and said labelling means, any entry that is sought can be quickly and accurately located therewith.

4,811,975

FLUID COUPLING AND METHOD OF MAKING SAME

Vernon Paul, Jr., Ocala, Fla., and James D. Fox, Westchester, Ohio, assignors to Dayco Products, Inc., Dayton, Ohio

Continuation of Ser. No. 346,350, Feb. 5, 1982, Pat. No. 4,431,218. This application Sep. 19, 1983, Ser. No. 533,313
Int. Cl.[4] F16L *37/14*
U.S. Cl. 285—305 **11 Claims**



1. In a first coupling member for a quick connect-disconnect coupling for a conduit that comprises said first coupling member and a second coupling member and retaining means for interlocking said members, said first coupling member having a generally cylindrical configuration comprising a main body portion, a reduced diameter body portion having a peripheral surface, and a first wall extending radially of an intersecting said portions, said main body portion having a peripheral groove therein, said second coupling member being adapted to be positioned over said first coupling member and have a principal cylindrical bore generally contiguous with said reduced diameter body portion, an enlarged diameter bore generally contiguous with said main body portion, and a second wall contiguous with said first wall and extending radially of and intersecting said bores, the intersection of said second wall and said principal bore forming a beveled shoulder, said enlarged diameter bore having a peripheral groove opposite the peripheral groove in said first coupling member, said retaining means comprising a U-shaped member having legs with said legs being adapted to be inserted into the peripheral grooves of

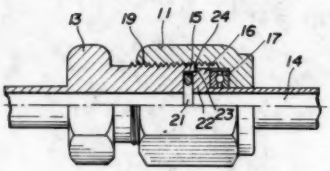
said first and second coupling members to interlock said members, said reduced diameter body portion of said first coupling member having a plurality of spaced peripheral grooves therein, and resilient sealing members positioned within said spaced grooves and being adapted to contact said second coupling member to create a fluid-tight seal, the improvement wherein one of said spaced peripheral grooves is located at the intersection of said first wall and said reduced diameter body portion and interrupts said peripheral surface immediately adjacent said first wall whereby said beveled shoulder is adapted to be located radially contiguous to said one peripheral groove and is adapted to engage and compress said sealing member in said one groove in such a manner that said sealing member in said one groove is adapted to be placed under compression and is adapted to apply axial and radial compressive forces between said first and second coupling members.

4,811,976

NUT HOLDING THRUST BEARING AND HIGHLY HERMETICAL SEALING FLUID JOINT WITH THE SAME NUT

Shigeru Yagisawa, Kawasaki, Japan, assignor to Toyoko Kagaku Co., Ltd., Kanagawa, Japan

Filed Jun. 23, 1987, Ser. No. 65,551
Claims priority, application Japan, Jul. 4, 1986, 61-102007[U]
Int. Cl.[4] F16L *25/00*
U.S. Cl. 285—328 **8 Claims**



1. A highly hermetical sealability cap nut clamping fluid joint for a semiconductor fabricating apparatus, the joint comprising

a tubular body having a threaded portion formed on the outer peripheral surface of one end of said tubular body;

a gasket;

a tubular sleeve having a flange formed on the outer peripheral surface of one end thereof for communicating in contact with a through hole of said body at the threaded portion side through said gasket, and

a female nut engaged with said sleeve for rigidly clamping said body and said sleeve by engaging with the threaded portion of said body,

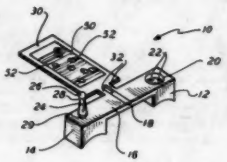
said female nut having an engaging recess formed on an inner surface thereof, and a thrust bearing press-fitted into the engaging recess of said female nut, said thrust bearing comprising a plurality of spheres filled in annular grooves between an inner race and an outer race and an annular element engaged with the outer peripheral surfaces of the inner and outer races, said thrust bearing in said recess being contacted under pressure with said sleeve flange, said gasket being a coil spring coated by a metal coating element.

4,811,977

LABELED SECURITY SEAL

Allan W. Swift, Denville, and Frank Venable, Hamburg, both of N.J., assignors to E. J. Brooks Company, Newark, N.J.

Filed Apr. 18, 1988, Ser. No. 182,333
Int. Cl.[4] G09F *3/03*
U.S. Cl. 292—307 A **4 Claims**



1. A labeled security seal comprising:

a security seal for sealing a container or the like including a surface thereon for receiving a label;

label means secured to said surface of said security seal, said label means for carrying information thereon; and

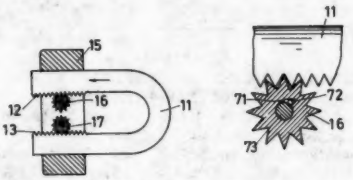
coincident non-linear scores formed in said label means and said surface of said security seal, said scores in said label being spaced such that attempted removal of said label will result in destruction of the label, said coincident scores being randomly spaces such as to render accurate replacement of said label with a substitute label having matching scores without evidence of tampering to be virtually impossible.

4,811,978

SIMPLIFIED SEALING STRIP

Don L. Wu, 57, Lane 7, Chung Chwan Road, Keelung, Taiwan

Filed Apr. 19, 1988, Ser. No. 183,064
Int. Cl.[4] B65D *33/34*
U.S. Cl. 292—323 **1 Claim**



1. A simplified abuse preventing sealing device, which comprises of a U-shaped sealing strip piece, such as a straight sealing strip piece bent into a U-shaped form, and a sealing block which allows the two legs of the said U-shaped sealing strip piece to be inserted in but brakes or stops them from to be pulled out in the reversal direction; the inner portion of the said sealing block is provided with gears, and the inner part of each said gear is provided with a slot having different width at it's two ends, inside each said slot it is provided with a free moving and rotating roller which furnishes braking or stopping function to the said gears for preventing them from rotation in the reversal direction, consequently, it makes each of the said gears to become a one-way rotating component; the U-shaped sealing strip piece is provided with toothed edges, or rows of consecutive slots, when the two legs of the said sealing strip piece is inserted into the said sealing block, the teeth or the slots on the leg portion of the sealing strip piece will engaged respectively on the teeth of the said gears of the sealing block and drive the respective gears to rotate; thereafter, if someone is trying to pull the said sealing strip piece out in the reversal direction, each of the said rollers will be clamped tightly inbe-

tween it's respective walls inbetween the slot of the said gear and the fixed axle, consequently, braking or stopping function is thus developed on the said gears for preventing the said U-shaped sealing strip piece from to be pulled our in the reversal direction.

4,811,979

BUMPER FOR VEHICLES

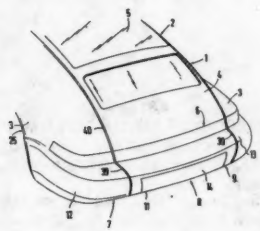
Dietmar Peter, Hemmingen, and Gebhard Poppele, Wangen i. Allgäu, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 6, 1987, Ser. No. 70,241

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1986, 3622483

Int. Cl.[4] B60R *19/02, 19/04*

U.S. Cl. 293—102 **19 Claims**



1. A bumper arrangement for a passenger motor vehicle or the like of the type having a vehicle body having a dimensionally stable bumper support means, comprising

an at least three part elastic covering means for covering the bumper support, said at least three part elastic covering means being formed of a central and two adjacent and separate side covering part means extending adjacent one another in a transverse direction of the vehicle, the central covering part means being held in position on the vehicle solely by said dimensional stable bumper support means and the side covering part means being firmly attached to the vehicle body, and

ends of said side covering part means having projection means engaging into receiving means of said central covering part means for releasably connecting the at least three covering part means to one another in such a manner as to permit selective replacement of said at least three covering part means.

4,811,980

COLLAPSIBLE BALL RETRIEVER AND STORAGE UNIT

Harry M. Ferrari, and John M. Shallenberger, both of Pittsburgh, Pa., assignors to Ball Hopper Products, Pittsburgh, Pa.

Filed Jun. 16, 1988, Ser. No. 207,677

Int. Cl.[4] A63B *47/02*

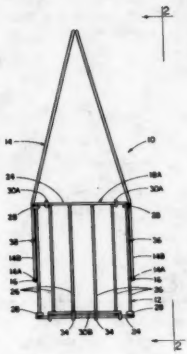
U.S. Cl. 294—19.2 **20 Claims**

1. A collapsible ball retriever and storage unit, comprising:

(a) a receptacle composed of a plurality of side structures and a bottom structure;

(b) said side structures being connected one to the next for relative pivotal movement to convert said side structures between erected and collapsed positions;

(c) said bottom structure being connected to at least one of said side structures for pivotal movement relative to said side structures between closed and retracted opened positions;



(d) said bottom structure being adapted to rigidly retain said side structures in said erected position when said bottom structure is disposed in said closed position.

4,811,981

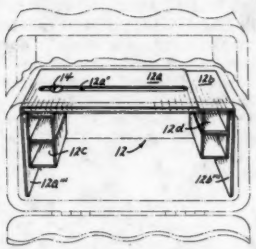
VEHICLE GLOVE COMPARTMENT ORGANIZER

Thomas E. Benson, 17A Orchard Dr., Olney, Ill. 62450

Filed Feb. 23, 1988, Ser. No. 159,207

Int. Cl.[4] B60R *7/06*

U.S. Cl. 296—37.12 **1 Claim**



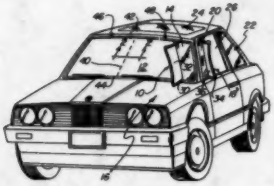
1. A storage item organizer for use within the cavity of a vehicle glove compartment having end walls, a back wall and top and bottom walls comprising a body defined by a first shelf portion and a second shelf portion slidable with respect to each other, means selectively fastening said first shelf portion and second shelf portion together at a position accommodating spacing between said end walls of said cavity, and a support member for said first shelf portion and said second shelf portion disposed on said bottom wall of said cavity, said support member inclining said organizer downwardly and rearwardly to prevent unwanted forward movement of a storage item, where said first shelf portion includes a storage compartment in a spaced apart relationship with the top wall thereof, where the top wall of said second shelf portion selectively extends within said space to said position accommodating spacing between end walls of said cavity, where said fastening means extends through cooperating cut-out areas in said first shelf portion and said second shelf portion, and where the top surfaces of said first shelf portion and said second shelf portion are in a spaced apart relationship with respect to said top wall of said cavity.

4,811,982

AUTOMOBILE WINDOW SHIELD AND COVERING

Richard Carlyle, 1195 Atlanta Way, Costa Mesa, Calif. 92626

Filed Jul. 13, 1987, Ser. No. 72,298
Int. Cl.[4] B60J *11/00*
U.S. Cl. 296—95.1 1 Claim



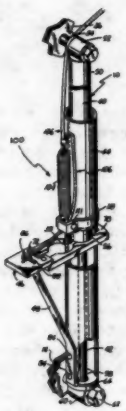
1. A protective window covering for vehicle windows, such as windshields, rear, and side windows, to prevent the accumulation of snow and ice on the windows of vehicles parked out-of-doors in winter weather, the protective cover being comprised of a thin, semi-flexible sheet of water-resistant material and having applied to a rear surface thereof, at least along peripheral edge regions, an adhesive backing enabling the sheet to be detachably mounted to the outside surface of a vehicle window, so as to cover major portions thereof, whereby removal of the sheet from the window causes the removal of any ice or snow which has accumulated on the sheet and which would otherwise have accumulated on the window to which the sheet was detachably applied, said sheet including means defining at least one tear line across the sheet so that the sheet can easily be torn into at least two pieces, being joined together in a pad.

4,811,983

GAS SPRING WITH LATCHING STOP MECHANISM FOR USE ON SKID-STEER LOADERS

Verne C. Watts; Orlan J. Lorass; Wally L. Kaczmarski, all of Lisbon, and James E. Asche, Milnor, all of N. Dak., assignors to Clark Equipment Company, South Bend, Ind.

Continuation-in-part of Ser. No. 931,681, Nov. 17, 1986, abandoned. This application Oct. 19, 1987, Ser. No. 110,226
Int. Cl.[4] B60J *1/00*
U.S. Cl. 296—190 27 Claims



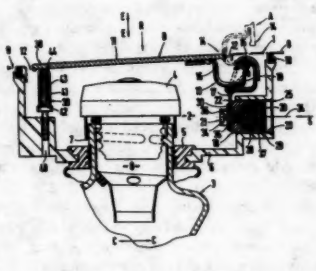
1. A gas spring, comprising:
a cylinder body;
a piston rod having a first end extending from the cylinder body and adapted for reciprocal linear movement between a normally extended position and a retracted position;
a stop tube mounted to the first end of the piston rod and telescopically cooperable with the cylinder body;
two slots positioned on opposite sides of and extending through the stop tube;
a stop slide having a pair of legs adapted to slide within the slots of the stop tube and having a release portion which will permit the cylinder body to pass between the legs, and a stop portion which will prohibit the cylinder body from passing between the legs; and
bias means for releasably and automatically biasing the stop slide from a release position at which the release portion of the stop slide is aligned with the cylinder body toward a stop position at which the stop portion of the stop slide is aligned with the cylinder body.

4,811,984

LID FOR CLOSING AN AUTOMOBILE BODY RECESS

Ulrich Hempel, Renningen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jan. 25, 1988, Ser. No. 148,355
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1987, 3702903
Int. Cl.[4] B60J *9/00*; B25G *3/00*
U.S. Cl. 296—97.22 13 Claims



1. A lid arrangement for closing a filler inlet compartment body recess of a motor vehicle, comprising a lid means contained at an outer area of said filler inlet body recess and adjustably positionable thereat to provide a substantially uniform clearance between all edges of said lid and said body recess and in a smooth plane with vehicle body structure adjacent said body recess; said lid means being pivotally connected to a first hinge arm; a second hinge arm being pivotedly mounted to the first hinge arm at a point inside the body recess to define a hinge joint and held in position at the body recess by means of an adjusting means; said adjusting means comprising an inner expandable cone means located within a clamping means; said clamping means being axially slidable in a receiving means of said body recess; a tensioning means acting on said inner expandable cone means to cause said cone means to be lockingly secured in said receiving means; the tensioning means securing the second hinge arm means to the clamping means via an adjustable connection utilizing an enlarged bore means surrounding a shaft diameter of the tensioning means with a clearance.

4,811,985

AUTOMOBILE ROOF HAVING A LID ASSOCIATED WITH A ROOF OPENING

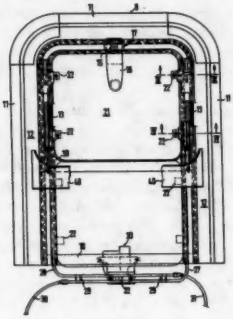
Peter Krüger, and Dieter Federmann, both of Hanau, Fed. Rep. of Germany, assignors to Rockwell-Golde G.m.b.H., Fed. Rep. of Germany

Filed Feb. 18, 1988, Ser. No. 160,750

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1987, 3706141

Int. Cl.[4] B60J *7/053, 7/057*

U.S. Cl. 296—214 **2 Claims**



1. An automobile roof comprising:

a fixed roof portion defining a roof opening;

a fixed vehicle liner beneath said roof opening, said liner itself having an opening;

a rigid lid for said roof which in the closed position closes said roof opening and which may be partly displaced by displacement means for said opening;

displacement means for moving said rigid lid within said opening;

a sliding liner which is displaceable below a rear portion of said fixed roof portion, said sliding liner closing the opening in the fixed vehicle liner when in a closed position;

said sliding liner having a front edge which in an open position lies above a rear edge of the opening of the fixed liner; drive apparatus connected with said sliding liner to move said sliding liner independently of the movement of said rigid lid; said drive apparatus including movement transmission elements which are connected to said sliding liner; lateral guide rails comprising a generally U-shaped configuration having inner and outer side walls joined by a lower web, opposed guide channels within said U-shaped configuration respectively carrying sliding elements and cable elements of said displacement means for guidance of said rigid lid, a back cut guide channel on an outer surface of said inner side wall; and a sliding piece connecting said sliding liner and one of said movement transmission elements, said sliding piece engaging within said back cut guide channel.

4,811,986

ADJUSTABLE LUMBAR SUPPORT

Takemi Hattori, Kariya, and Hirofumi Kume, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Mar. 1, 1984, Ser. No. 585,185

Claims priority, application Japan, Mar. 3, 1983, 58-30636

Int. Cl.[4] A47C *7/46*

U.S. Cl. 297—284 **1 Claim**

1. A lumbar support for a backrest having a lumbar portion designed to be horizontally and vertically aligned with the lumbar region of a user of the backrest, said lumbar support being adjustable according to desired horizontal and vertical adjustment settings and comprising:

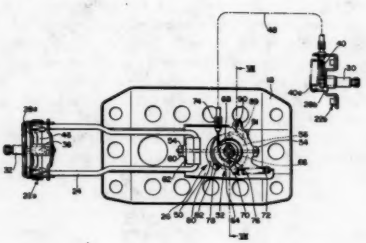
a. a support plate having front and rear surfaces, at least a portion of said front surface engaging the rear of said lumbar portion of said backrest to define an effective contact region, the horizontal position and vertical alignment of which varies with the vertical inclination and horizontal adjustment of said support plate;

b. first bracket means in fixed vertical position relative said backrest, said first bracket means pivotally supporting said support plate to permit changes in the vertical inclination of said support plate;

c. a cam member disposed between said support plate and said first bracket means and rotatably fixed to said first bracket means and rotatable in one direction to rotate said support plate to change the vertical inclination of said support plate, said cam member having a series of pawls circumferentially disposed about said cam member;

d. a frame supporting said backrest;

e. first control means for slidably positioning said support plate by an amount determined by the desired horizontal adjustment setting to align said effective contact region horizontally with the lumbar region of a user, said control means including a first casing fixed to said frame; a first shaft rotatably connected to said first casing; a coupler rotatable with said first shaft and having a cam surface; a torsion spring connected between said support plate and



said first casing and slidably contacting said cam surface, wherein rotation of said cam surface varies the tension applied to said support plate by said torsion spring,

f. second control means for rotating said cam member by an amount determined by the desired vertical adjustment setting, to align said effective contact region vertically with the lumbar region of a user, said control means including a second casing fixed to said frame, said first and second casings being affixed at substantially opposite sides of said backrest; a second shaft rotatably connected to said second casing; and transmission means for converting rotation of said second shaft into rotation of said cam member, said transmission means including:

an adjustment plate integrally attached to said second shaft;

a release plate for rotatably positioning said cam member;

cable means extending between said adjustment plate and said release plate for rotating said cam member in response to rotation of said adjustment plate in a first direction; and

means for biasing said adjustment plate in a direction counter said first direction; and

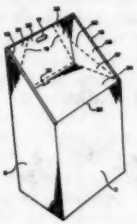
g. means for restricting rotation of said cam member in a direction counter said first direction including an extension pivotally mounted on said support plate and spring means for biasing said extension to engage corresponding ones of said series of pawls.

4,811,987

UNITARY DISPOSABLE CHAIR, FORMABLE FROM FIBERBOARD IN ONE PASS WITH MINIMAL WASTE, AND QUICKLY SET UP

James R. Volpe, 2710 S. San Pedro St., Los Angeles, Calif. 90011, and James L. Kelley, 22461 St. Andrews Ave., Cupertino, Calif. 95014

Filed Dec. 30, 1986, Ser. No. 947,645
Int. Cl.[4] A47C *4/00*
U.S. Cl. 297—440 **12 Claims**



1. A disposable chair that in a few seconds can be folded substantially flat for storage and shipment or unfolded and configured for use; said chair comprising:

four substantially contiguous and substantially rectangular panels of material that is of generally planar character, extended in only two dimensions and substantially thin in a third dimension but sufficiently stiff and strong in the aggregate, when configured for use, to support a person; said four rectangular panels defining generally vertical edges of substantially equal length, which length is the overall height of the chair;

one pair of the four rectangular panels being mutually of substantially equal width, which is substantially the width of the chair when in use; one of the pair forming the back of the chair, and the other of the pair having portions that respectively form the front and seat of the chair;

another pair of the four rectangular panels being mutually of substantially equal width, which is substantially the front-to-back depth of the chair when in use; each of this other pair forming one of the sides of the chair;

said four rectangular panels being joined along substantially the entire lengths of their equal-length edges, the side panels alternating with the front and back panels to form an upstanding tube of substantially rectangular plan;

a fifth rectangular panel that is disposed erect within the tube, and that:

defines two vertical edges and a horizontal upper edge,

is joined along its two vertical edges to one or the other pair of rectangular panels,

is parallel and nearly equal in width to the remaining pair of rectangular panels,

is also of generally planar material that is sufficiently stiff and strong to significantly aid in supporting, and in distributing to the other four panels for support thereby, the weight of a person, and

stands parallel to the front and back of the chair;

wherein the seat-forming portion of the panel that forms the front and seat of the chair is folded downwardly and inwardly, with respect to the tube, against the back of the chair to be supported by the horizontal upper edge of the fifth panel;

wherein the height of the fifth panel defines the height of the seat panel above the bottom of the chair, and very generally equals the difference between the overall height of the chair and said front-to-back depth of the chair;

an intermediate generally planar vertical strip interconnecting one vertical edge of the fifth panel with a vertical edge of one of the other four panels; said strip standing parallel to and in generally planar contact with some one of the other four panels and being of a width that is very generally half the width or depth of the chair;

a generally vertical tab, unitary with the other vertical edge of the fifth panel, that secures said other vertical edge to a rectangular panel which is opposite the intermediate strip, and that joins the fifth panel to one side of the chair; said intermediate strip being parallel to and in generally planar contact with the opposite side of the chair; and

a stiffening-angle tab joined to the fifth panel along the horizontal upper edge of that panel, and folded backward and downward toward a generally horizontal orientation; and wherein:

all of said five panels, the intermediate strip and the vertical tab are formed of a single unitary blank;

one of the four first-mentioned rectangular panels is at one end of the blank and the tab is at the other end of the blank;

the panel that is at one end of the blank is secured to the intermediate strip;

each side panel is doubled over and inwardly, with respect to the tube, along a line extending generally from the top rear corner downward and forward to intersect the fold in the panel that forms the front and seat; and

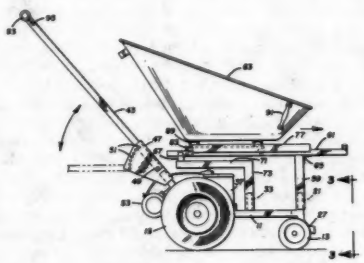
upper portions of the side panels are adapted for folding along additional intermediate angled lines, to permit buckling deformation of the tube out of rectangular plan and thereby to facilitate folding of said seat-forming portion upward and outward relative to the tube for shipment and storage, or downward and inward relative to the tube for use.

4,811,988

POWERED LOAD CARRIER

Erich Immel, 6525 Fairmount Ave., El Cerrito, Calif. 94530

Filed Mar. 9, 1987, Ser. No. 23,538
Int. Cl.[4] B62B *3/08*
U.S. Cl. 298—2 **1 Claim**



1. A multipurpose powered load carrier or pusher comprising

a lower frame having at least one stabilizer wheel mounted proximate the front end thereof and a pair of large drive and load carrying wheels mounted proximate the rear end thereof, said frame being adapted to engaging variable load carrying or pushing attachments,

a control bar secured to and extending rearwardly and adjustably upwardly from the rear end of said lower frame,

a motor mounted on said control bar including drive means engaging said motor with said drive wheels,

an upper frame detachably engaged with said lower frame and including a pair of horizontal tracks for supporting a detachable load carrying apparatus, said horizontal tracks including partial covers for at least a portion of the length thereof, said tracks being hinged with respect to said upper frame at its forward end whereby said tracks can be tipped forward with respect to said lower frame, and

a detachable load carrying apparatus which includes supports depending from said apparatus and being formed to engage said tracks in a manner whereby said supports are captured in a sliding relation by the covers on said tracks to prevent movement of said supports out of said tracks in an upward direction, said apparatus being movable forward or rearward on said tracks relative to said frame between a load carrying position at the rearward position on said tracks whereby the load on the load carrying apparatus is carrying apparatus is most closely disposed over said drive wheels and an unloading position on said tracks wherein the load is disposed at the forward end of said carrier proximate the pivot center of said hinge.

4,811,989

PROCESS FOR MANUFACTURE OF CLOSED END MOPS

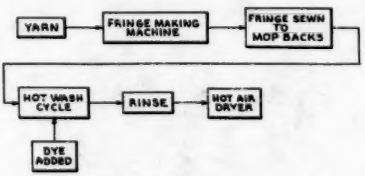
Robert W. Quearry, Raytown, Mo.; Robert D. Chalfant, Atchison, Kans.; Richard W. Chalfant, Atchison, Kans., and Robert E. Liggett, Atchison, Kans., assignors to Golden Star, Inc., North Kansas City, Mo.

Division of Ser. No. 874,018, Jun. 13, 1986, Pat. No. 4,752,985. This application Oct. 8, 1987, Ser. No. 106,069

The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.

Int. Cl.[4] A47L *13/20*

U.S. Cl. 300—21 **7 Claims**



1. A process for making pre-sewn fringe comprising the steps of:

(a) providing spun, cotton based yarns of at least a single ply and having an inherent high degree of twist with a minimum of six twists per inch;

(b) processing said yarns through a fringe making machine and laying said yarns into said fringe substantially side by side with said yarns forming continuous uncut ends; said yarns tending to bunch together in unruly, thick, twisted masses of yarn strands;

(c) soaking said fringe in a high temperature water bath until said masses of yarn strands relax, straighten and separate; and

(d) drying said fringe in a hot air dryer at high temperature until said yarns shrink and twist about the uncut ends to form individual, doubled strands with uncut ends.

4,811,990

PROCESS FOR MANUFACTURE OF CLOSED END WET MOPS

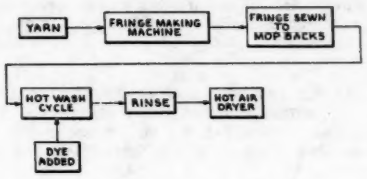
Robert W. Quearry, Raytown, Mo.; Robert D. Chalfant, Atchison, Kans.; Richard W. Chalfant, Atchison, Kans., and Robert E. Liggett, Atchison, Kans., assignors to Golden Star, Inc., North Kansas City, Mo.

Division of Ser. No. 916,629, Oct. 7, 1986, Pat. No. 4,750,234, which is a continuation-in-part of Ser. No. 874,018, Jun. 13, 1986, Pat. No. 4,752,985. This application Oct. 8, 1987, Ser. No. 106,070

The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.

Int. Cl.[4] A47L *13/20*

U.S. Cl. 300—21 **2 Claims**



1. A process for making wet mops comprising the steps of:

(a) providing spun, cotton based yarn strands of at least a single ply and having an inherent high degree of twist with a minimum of six twister per inch;

(b) processing said yarns through a mop making machine and laying said yarns into a yarn strand assemblage substantially side-by-side with yarns strands forming continuous uncut ends; said yarn strands tending to bunch together in unruly, thick, ropy twisted masses of yarn strands;

(c) binding said yarn strand assemblage together about a collapsed central section thereof;

(d) soaking said yarn strand assemblage in a high temperature water bath until said masses of yarn strands relax, straighten and separate; and

(d) drying said yarn strand assemblage in a hot air dryer at high temperature until said yarn strands shrink and twist about the uncut ends to form individual, doubled, strands with uncut ends.

4,811,991

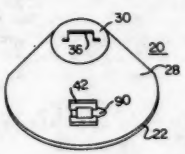
TIRE RIM PROTECTOR FOR CLEANING AND APPLYING A LIQUID PROTECTANT TO TIRES

Ernie A. Moreno, and Ray D. Moreno, both of 1305 Woodale Ct., San Jose, Calif. 95127

Filed Aug. 10, 1987, Ser. No. 83,050

Int. Cl.[4] B60B *7/00*; B05C *11/00*

U.S. Cl. 301—37 R **15 Claims**



1. A tire rim protector for masking a tire rim while cleaning or applying a liquid protectant to the rubber portion of a tire, comprising: a hollow member, said member being defined by thin walls having an outer surface and defining an inner space therewithin; a first opening formed in said walls, said opening being circular and having an outer diameter that is slightly

larger than the diameter of the tire rim which said member is designed to mask; a handle being engaged with said outer surface of said walls and disposed to facilitate the gripping and maneuvering of said member;

said walls of said member being formed in a frustro-conical shape such that a first portion of said walls is conically shaped and a second portion of said walls is disk shaped and wherein said handle is engagably disposed upon said disk-shaped portion;

said frustro-conically-shaped member including an outer substantially conically-shaped portion formed for engaging said tire rim and an inner conically-shaped portion, and wherein said outer portion is formed having a more acute apex angle than the apex angle of said inner portion; and

an applicator holder means being fixedly engaged to the outer surface of said member and an applicator being removably engagable within said holder.

4,811,992

WHEEL-MOUNTING ARRANGEMENT WITH EMERGENCY BEARING SURFACE

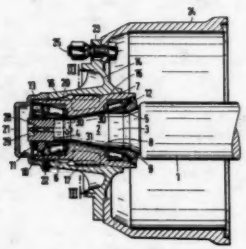
Helmut Steiner, Wiehl, Fed. Rep. of Germany, assignor to Bergische Achsenfabrik Fr. Kotz & Söhne, Wiehl, Fed. Rep. of Germany

Filed Dec. 4, 1987, Ser. No. 128,993

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1986, 3643081

Int. Cl.[4] B60B *27/00*; **F16C** *21/00*

U.S. Cl. 301—105 R **8 Claims**



1. In a wheel-mounting arrangement for trailer axles, including tapered-roller bearings that are disposed on an axle spindle, and a hub that is rotatably mounted on said spindle via said roller bearings, whereby a brake drum and a wheel or TRILEX star can be secured to said hub, which comprises an inner hub and an outer hub that is fixedly secured to said inner hub, the improvement wherein:

said axle spindle has a tapered configuration in the region between said tapered-roller bearings, and said inner hub has a corresponding, inwardly projecting, tapered configuration between said roller bearings, with said tapered portions of said axle spindle and said inner hub together forming a sliding bearing for emergency operation in the event that said roller bearings become damaged.

4,811,993

ANTI-SKID CONTROL SYSTEM FOR BRAKING OF VEHICLE

Naoki Matsumoto, Kariya; Hiroaki Kurasoka, Oobu; Naoto Ohoka, Toyohashi, and Masahiro Ohba, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 16, 1987, Ser. No. 109,178

Claims priority, application Japan, Oct. 17, 1986, 61-247959

Int. Cl.[4] B60T *8/10*

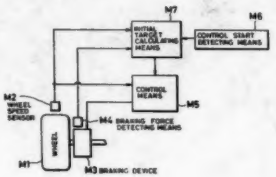
U.S. Cl. 303—100 **3 Claims**

1. An anti-skid control system for a vehicle with at least one wheel which is arranged to be braked by braking means, comprising:

wheel sensor means for sensing a rotational speed of said wheel, for generating a signal indicative of the sensed wheel speed, and for determining a rotational torque of said wheel;

brake sensor means for sensing a braking force of said braking means, for generating a signal indicative of the sensed braking force, and for determining a braking torque;

control start determining means for determining an occurrence of a start of said anti-skid control system, whereby said braking force on said wheel is decreased to prevent a locking of said wheel;



initial braking force determining means, coupled to said control start determining means and responsive to said occurrence of said start of said anti-skid control system, for determining an initial target braking force on the basis of said rotational torque of said wheel and said braking torque, said rotational torque and said braking torque being determined at said occurrence of said start of said anti-skid control system; and

control means, coupled to said initial brake force determining means, for controlling said braking means so that said braking force becomes equal to said initial target braking force.

4,811,994

HYDRAULIC BRAKE SYSTEM

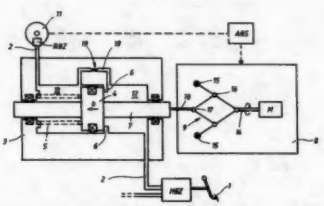
Michael Friedow, Tamm, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 24, 1987, Ser. No. 126,077

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1987, 3702906

Int. Cl.[4] B60T *8/32*

U.S. Cl. 303—115 **21 Claims**



1. A hydraulic brake system having a hydraulic control cylinder used for brake pressure modulation when disposed between and connected to a master brake cylinder and at least one wheel brake cylinder, said hydraulic control cylinder includes a piston which is connected via a piston rod to an electromechanical positioning mechanism, said electromechanical positioning mechanism includes a motor and a centrifugal positioner (9, 20, 26) driven by an electric motor (M), said centrifugal positioner converts rotational forces into tractive pressure forces which engage said piston rod to counteract a pressure on said piston rod produced by fluid from a master brake cylinder connected thereto.

4,811,995

STORAGE CONTAINER FOR DISC-FORM RECORDING MEDIA

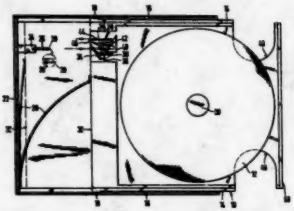
Peter Ackeret, Allmendstr. 18, CH-8700 Kusnacht, Switzerland

Continuation of Ser. No. 644,960, Aug. 28, 1984. This application Dec. 1, 1986, Ser. No. 936,146

Claims priority, application European Pat. Off., Aug. 29, 1983, 83108478.5; Aug. 29, 1983, 83108481.9; Fed. Rep. of Germany, Aug. 2, 1984, 8423026[U]

Int. Cl.[4] A47B *81/06*

U.S. Cl. 312—15 15 Claims



1. Apparatus for storing rigid disc-shaped recording media which contain a region of recorded information, said apparatus comprising:

housing means for defining a container having an internal volume, said housing means having plural walls, some of said walls having edges which lie in a common plane and define a front access opening for the container;

at least one disc holder supported in said housing means for reciprocal movement through an allocated area of said access opening along a predetermined path between a storage position wherein a disc supported on the holder lies entirely within the container and an ejected position wherein the holder and supported disc lie partly outside the container, said disc holder including,

means for supporting a disc for movement with the holder along said path, said supporting means including a bottom member having an outer portion for contacting the supported disc adjacent its periphery outside of the region containing the recorded information and a central portion which is delimited by said outer portion and spaced from the region of the disc containing the recorded information, and

means for positioning and retaining a disc on said supporting means, said positioning and retaining means resiliently engaging selected portions on the circumference of the disc when the holder has reached the ejected position, said positioning and retaining means being located to exert retaining and positioning forces upon the supported disc, said forces being overcome when the disc is manually grasped and pulled generally in a first direction from the ejected holder, said forces also being overcome during placement of a disc on said supported means of the ejected holder by the manual pushing of the disc in a second direction generally opposite to said first direction, said forces urging the disc to the proper position on said supporting means after having been overcome during such placement of a disc on said supporting means;

means for guiding the holder in the reciprocal movement thereof along said path;

biasing means cooperating with said housing means and said holder for biasing the holder toward the ejected position; and

means for locking and manually unlocking said holder within said housing means against the bias produced by said biasing means.

4,811,996

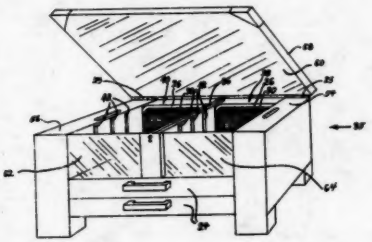
DECORATIVE DISPLAY AND STORAGE CASE

Maria Hansson, 331 Joan St., Roskoskoma, N.Y. 11779

Continuation of Ser. No. 892,385, Jul. 31, 1986, abandoned. This application May 16, 1988, Ser. No. 195,432

Int. Cl.[4] B65D *1/24*

U.S. Cl. 312—132 1 Claim



1. A decorative display and storage case for attractively displaying and protectively storing earrings for pierced ears comprising:

a base having a storage drawer therein,

four upstanding walls mounted on said base and forming a rectangular enclosure upstanding on said base,

one of the walls being a front wall having a transparent panel therein for permitting viewing of at least a part of the contents in the enclosure formed by said walls,

a plurality of upstanding plastic mesh display screens each having numerous rows of numerous small openings therein of about 1/16th of an inch in diameter adapted to received therein the earlobe mounting element of earrings for pierced ears for convenient storage and display of such earrings,

each of said mesh display screens having a handle thereon for facilitating the movement of the display screen with the earrings positioned thereon,

two of the walls in face-to-face relationship having a plurality of upright opposed aligned slots, said slots being aligned in opposed pairs slidably receiving one of said display screens in each pair of said opposed aligned slots,

a cover hinged on the top of one of said walls for opening and closing said enclosure,

said hinged cover having a mirror mounted on the lower surface of said cover whereby positioning said mirror at different angles will provide the viewer with different views of the display screens in said case to aid in the selection of the display screen having the desired earrings supported thereon without having to remove all the display screens,

said slots retaining until slidably removed therefrom a plurality of said display screens,

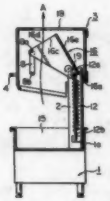
said enclosure being divided into compartments by a center partition having upright slots on both sides thereof which slots are aligned with opposed slots in said two walls having said face-to-face relationship thereby increasing the number of display screens capable of being housed in said case, thereby forming a display and storage case whereby the display screen carrying the earrings of interest may be quickly located through said transparent wall and easily slid upwardly along the pair of slots in which said display screen is being removably stored in the case for providing a portable, attractive case and display screens for storing and/or displaying and handling such earrings.

4,811,997

DISHWASHER

Koji Suyama, and Akiyoshi Yoshida, both of Toyoake, Japan, assignors to Hoshizaki Electric Co., Ltd., Toyoake, Japan

Filed Feb. 19, 1988, Ser. No. 158,236
Int. Cl.[4] A47B *51/00*
U.S. Cl. 312—228 **8 Claims**



1. A dishwasher, comprising;

a main body defining therein a washing tub having a top opening, and further having a rear part;

a box-like cover disposed above said main body for movement between a lower position at which the top opening of said washing tub is closed by said cover and an upper position at which said top opening of said washing tub is opened, said cover being constituted by a front portion provided with a handle, a rear portion, an open bottom portion, a top portion having an opening therein, and a pair of side portions for connecting together said front portion, said rear portion and said top portion;

means provided on said rear part of said main body for supporting said cover and guiding the movement thereof between said lower position and said upper position;

a shield member having a rear end portion and a front end portion, said shield member being disposed within said cover and having said rear end portion pivotally mounted on said supporting and guiding means close to said rear portion of said cover so as to be swingable between a blocking position where said shield member substantially closes said opening in said top portion of said cover when said cover is at said lower position and an open position where said opening in said top portion of said cover is open when said cover is at said upper position;

means pivotally coupled at one end thereof to a portion of said shield member at a position spaced from said rear end portion of said shield member and at the other end to said cover at a lower portion thereof for translating the movement of said cover to rotation of said shield member; and

means disposed internally of said supporting and guiding means for normally urging said cover toward said upper position.

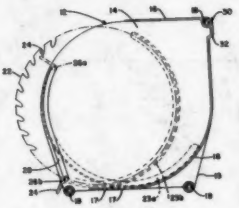
4,811,998

STORAGE AND DISPENSING DEVICE

Joseph W. Rankin, 3770 Old Colony Dr., Canton, Ohio 44218

Filed Aug. 3, 1987, Ser. No. 80,907
Int. Cl.[4] A47B *77/06*
U.S. Cl. 312—229 **2 Claims**

1. A disc storage and dispensing device comprising a plurality of connected partition modules in combination with dispensing cradles adapted to hold relatively thin discs therein, one cradle being disposed between each pair of adjacent partition modules, each said cradle having actuating means located on one end thereof with a boss adjacent said means on one side of said cradle, said means extending from the front of said device between a pair of adjacent partition modules, and in its disc storage position, said boss extending through an arcuate guide slot located near the front edge of an adjacent partition module, said guide slot and said cradle both being disposed in a substantially convex position with respect to the front of said device, and when the dispensing disc is desired, said actuating means is pressed downward, causing said boss to follow said guide slot downward, and said cradle is thereby moved into a substantially concave position with respect to the front of said device, forcing its contained disc to partially project from the front of the device, where the disc is easily grasped and removed, and wherein the front, and the lower rear quadrant of said partition modules have a substantially arcuate shape, and wherein said partition modules are fitted with a flange, said



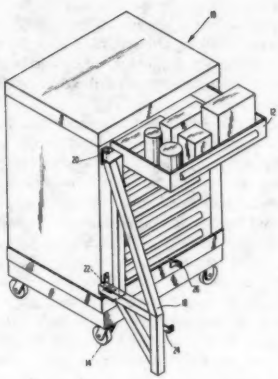
flange being disposed at right angles to, and around a substantial portion of the top, bottom and rear periphery of said partition modules, and in which drain openings are provided in the bottom periphery of said flange, and the rear portion of said flange is notched and provided with an offset adapted to receive an anchor fastener, there being at least a sufficient number of partition modules laterally connected together by means of fasteners to form a stable assembly.

4,811,999

CABINET WITH PIVOTED LOCKING OUTRIGGER

John L. Remington, Coplay, and Harry W. Seidel, Mertztown, both of Pa., assignors to The Stanley Works, New Britain, Conn.

Continuation of Ser. No. 576,327, Feb. 2, 1984, abandoned. This application Oct. 2, 1985, Ser. No. 783,255
Int. Cl.[4] A47B *91/00*
U.S. Cl. 312—250 **5 Claims**



1. A locking and stabilizing outrigger for a cabinet of the type having a plurality of horizontally extendable drawers, comprising:

a rigid strut member mounted for pivoting between a locking position and a stabilizing position about a vertical axis beyond the lateral extension of the drawers on the face of the cabinet from which the drawers may be extended, said strut member having a width and length adequate to extend over at least a portion of each of the drawers on the

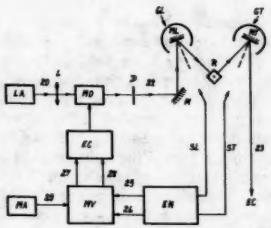
face of the cabinet to prevent the drawers from being extended to open position when said outrigger is in the locking position, such that said outrigger must be pivoted outwardly into a stabilizing position prior to opening of the drawers, said strut member having a length adequate to extend at least as low as the bottom of the cabinet and having a width adequate to prevent tipping of the cabinet when one or more of the drawers is moved to open position and said outrigger is pivoted to the stabilizing position beyond the position of the drawers when the drawers are open.

4,812,000

SYSTEM FOR GENERATING FRAME SWEEPING WITH LASER BEAM, IN PARTICULAR FOR PROJECTING IMAGES

Philippe Rouille, Elancourt, and Roland Jezequel, Gauthier, both of France, assignors to Thomson-CSF, Paris, France

Filed Mar. 30, 1987, Ser. No. 31,411
Claims priority, application France, Apr. 2, 1986, 86 04693
Int. Cl.[4] G02B *26/08, 26/10*
U.S. Cl. 350—6.6 10 Claims



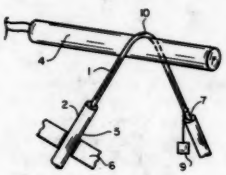
1. System for generating framed sweeping with a laser beam, in particular for the projection of images, wherein it comprises a deflector system with two pencil galvanometers each having a mirror, and a prism rotator between said galvanometers for deflecting a light beam from one of the galvanometers through 90° to the other galvanometer.

4,812,001

ANNEALING BENT OPTICAL FIBER

Akira Tomita, Redwood City, and Mark Ostasiuk, Newark, both of Calif., assignors to Raychem Corp., Menlo Park, Calif.

Filed Jul. 28, 1987, Ser. No. 78,356
Int. Cl.[4] G02B *6/16*
U.S. Cl. 350—96.3 15 Claims



13. A bent optical fiber, comprising:

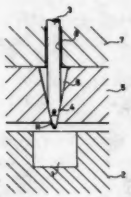
an optical fiber, the fiber including first and second straight sections interconnected by a bent section having a radius of curvature less than a minimum bend radius for the fiber, the bent section having been annealed during formation by heating with its buffer removed therefrom so as to reduce static strain thereat.

4,812,002

OPTICAL COUPLING DEVICE AND METHOD OF MAKING THE SAME

Takeshi Kato, Kokubunji; Kenichi Mizuishi, Hachioji, and Katsuki Chiba, Akigawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 23, 1987, Ser. No. 111,590
Claims priority, application Japan, Oct. 24, 1986, 61-251640; Feb. 18, 1987, 62-33270
Int. Cl.[4] G02B *6/42*
U.S. Cl. 350—96.18 17 Claims



1. An optical coupling device comprising:

an optical device;

an optical fiber having a first optical axis, a greatest outer diameter and a distal end tapered to exhibit a least outer diameter, said distal end having a terminal portion formed into a hemispherical lens;

a receptacle having a channel extending throughout the length of the receptacle and receiving said optical fiber;

a guide adjoining one end of said receptacle, said guide being disposed between the optical device and the channel of the receptacle and having a through-hole with an inner diameter smaller than the greatest outer diameter of said optical fiber, said through-hole being optical-axis aligned with said optical device, and the inner diameter being larger than the least outer diameter of the distal end of said optical fiber, and said receptacle being displaceable transversely relative to said through-hole to provide optical-axis alignment between said channel and said through-hole,

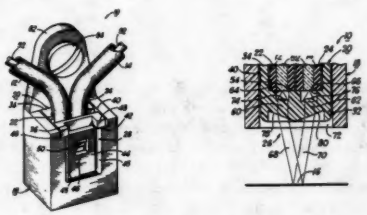
said distal end being fitted into said through-hole to optically couple said optical fiber to said optical device.

4,812,003

OPTIC SENSING ASSEMBLY

Philip J. Dambach, Naperville, Ill., and Ray Brown, Los Gatos, Calif., assignors to Molex Incorporated, Lisle, Ill.

Filed Nov. 10, 1987, Ser. No. 119,012
Int. Cl.[4] G02B *6/32*
U.S. Cl. 350—96.18 23 Claims



10. For use in an optical sensing system for sensing light reflection at a target area, the system including a fiber optic light supply cable and a fiber optic light receiving cable, each

cable having an end disposed in proximity to the target area, an improved optic sensing assembly comprising in combination:

a housing including a front end with an opening, a rear end with an opening, a cavity extending between said openings and mounting means for supporting the housing with its front end in a predetermined orientation with respect to a target area;

a unitary cable holding element including a front end and means for socketing the supply and receiving cable ends and lens means disposed between the front end of said holding element and said socketing means in light transmitting relation with said socketing means for directing light from the light supply cable upon the target area and for directing light from the target area upon the light receiving cable;

said light supply and light receiving cable ends retained in said cable holding element socket means adjacent the lens means; and

said cable holding element received in the housing cavity and retained therein so that the front end of said holding element is positioned adjacent the opening in the front end of the housing.

4,812,004

SPLICE CASSETTE HOUSING

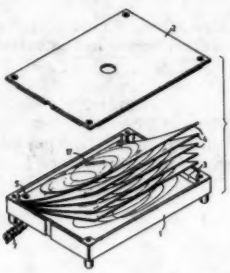
Lutz Biederstedt; Dieter Gerke, and Claus Sander, all of Berlin, Fed. Rep. of Germany, assignors to Krone AG, Fed. Rep. of Germany

Filed Nov. 25, 1987, Ser. No. 125,494

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1986, 3640836

Int. Cl.[4] G02B 6/36

U.S. Cl. 350—96.20 **9 Claims**



1. A splice cassette housing for optical waveguides, defining a housing compartment having a bottom with an opening for a flexible optical waveguide cable hose and including a groove extending along said bottom defining an optical waveguide receiving channel which extends through a curve within said housing compartment and which extends back upon itself and provides a guide groove for at least one of said optical waveguides which is effected to change the direction thereof by 180°, said optical wave guides having a plurality of separate reserve lengths, and a plurality of pockets in said compartment arranged one above the other and containing respective lengths of said wave guides.

4,812,005

ARRANGEMENT FOR COUPLING A LASER DIODE AND A MONOMODE LIGHT WAVEGUIDE HAVING A FEEDBACK MEANS

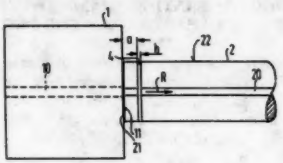
Walter Heywang, Neukeferloh, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 910,610, Sep. 23, 1986, abandoned. This application Mar. 16, 1987, Ser. No. 26,207

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1985, 3534016; European Pat. Off., Sep. 15, 1986, 86112714.0

Int. Cl.[4] G02B 7/26

U.S. Cl. 350—96.20 **8 Claims**



1. An arrangement for coupling a laser diode and a monomode light waveguide, said arrangement comprising a gain-guided laser diode having a coupling surface, a monomode light waveguide being an optical glass fiber having an end face forming a coupling surface engaging the coupling surface of the laser diode to form a coupling location, said waveguide having feedback means at a distance from the coupling location for conducting a part of the light coupled into the light waveguide back in the waveguide to the laser diode, said feedback means comprising at least one metallized ring having a width of a few wavelengths being applied on an outer surface of the glass fiber at a distance of a few micrometers from the end face of the waveguide.

4,812,006

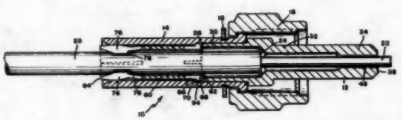
FIBER OPTIC CONNECTOR WITH COLLEY RETENTION

Glenn M. Osborn, Newtown, Conn., and Robert D. Essert, Poughkeepsie, N.Y., assignors to Amphenol Corporation, Wallingford, Conn.

Filed Nov. 23, 1983, Ser. No. 554,858

Int. Cl.[4] G02B 6/38

U.S. Cl. 350—96.21 **18 Claims**



17. In a connector for an optical fiber cable having an inner optical fiber and an outer protective jacket, said connector having a body including a front body portion adapted to receive the optical fiber and a rear body portion adapted to receive the optical fiber cable, a bore extending from the front body portion to the rear body portion and being defined by respective inner walls of the front and rear body portions, and a collet for retaining the optical fiber cable in the rear body portion, the improvement comprising:

said collet being compressible and being insertable into said rear body portion, said collet having a front end, a rear end and a generally tubular configuration defined by an exterior surface and an interior bore, said collet comprising compressible retaining means for retaining said collet within said rear body portion when said collet is fully

inserted into said rear body portion, compressible clamping means for clamping against said protective jacket of said optical fiber cable when said collet is fully inserted into said rear body portion to retain the cable within said collet, and a plurality of slots in said exterior surface of said collet adjacent said retaining means and said clamping means,

said retaining means comprising a plurality of projections extending radially outwardly of said exterior surface of said collet adjacent to said front end of said collet, a shoulder portion on each of said projections, said rear body portion including a recess in its inner wall adjacent to the rear end of said front body portion, said recess adapted to receive said plurality of said projections to permanently retain said collet within said rear body portion,

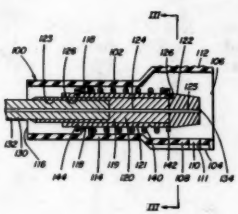
said clamping means comprising a plurality of wedge-shaped clamping portions adjacent to said rear end of said collet, each of said clamping portions including a shoulder portion extending radially inward of said interior bore of said collet, and each of said clamping portions including an outer wall including an outwardly inclined section terminating in a generally straight section adjacent to said rear end of said collect for engagement with said inner walls of said rear body portion, said clamping means being compressed by said inner walls of said rear body portion upon insertion of said collet into said rear body portion, said shoulder portions being compressed against said outer protective jacket of said optical fiber cable when said collet is fully inserted into said rear body portion, whereby said optical fiber cable is retained in a fixed position relative to said collet and is retained within said connector.

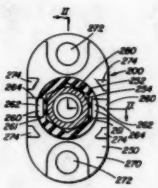
4,812,007

OPTICAL FIBER CONNECTOR

Helmut H. Lukas, Ontario, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Dec. 7, 1987, Ser. No. 130,253
Int. Cl.[4] G02B *6/38*
U.S. Cl. 350—96.21 **12 Claims**





1. An optical fiber connector, comprising:

a female member having a continuous wall defining a chamber open at one end of the female member, the wall having a first wall portion which carries a first latching formation and a second wall portion opposite the first wall portion, the first latching formation being accessible from within the chamber, and the wall being resiliently deformable such that inward deformation of the wall at opposed locations spaced angularly in opposite directions from the first latching formation causes outward deformation of the wall at the first latching formation to move the first latching formation outwardly;

a male member for assembly to the female member by insertion axially into the open end of the chamber, the male member having a first side which carries a second latching formation, a second side opposite the first side, and a lateral extension carrying a stop formation spaced laterally of the second side, said second latching formation provided on the male member for engagement with the first latching formation to latch the male member to the female member, the male member being spaced inwardly of the wall at said opposed locations when latched within the chamber to permit inward deformation of the wall at said locations sufficient to disengage the first latching formation from the second latching formation by outward movement of the first latching formation, the first wall portion of the female member being adjacent to the first side of the male member and the second wall portion of the female member fitting between the second side of the male member and the stop formation when the male member is fitted to the female member, and the stop formation limiting lateral movement of the second wall portion upon inward deformation of the wall at said opposed locations so that further inward deformation of the wall at said opposed locations forces the first wall portion away from the first side to disengage the first latching formation from the second latching formation; and

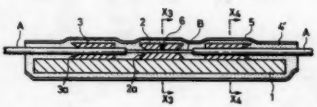
a first fiber holding means of the connector within the female member for holding an end portion of a first optical fiber to extend axially along the female member, and a second fiber holding means of the connector within the male member for holding an end portion of a second optical fiber to extend axially along the male member such that assembly of the male member to the female member axially aligns the first and second optical fibers.

4,812,008

METHOD AND APPARATUS FOR CONNECTING OPTICAL FIBERS

Yuzo Tokumaru, and Osamu Nishi, both of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 15, 1987, Ser. No. 73,822
Claims priority, application Japan, Jul. 21, 1986, 61-172294
Int. Cl.[4] G02B *6/40*
U.S. Cl. 350—96.21 **6 Claims**



1. A connection member for connecting optical fibers comprising:

a wire member having a longitudinally extending groove defined in an outer surface thereof;

a fitting sleeve attached to said wire member in said groove, said fitting sleeve having a longitudinal inner bore for receiving a bare optical fiber;

a pair of guide sleeves attached to said wire member in said groove on each side of said fitting sleeve, each of said guide sleeves having a longitudinal bore for receiving a coated optical fiber;

a thermal melting adhesive sleeve covering said wire member, said fitting sleeve and said guide sleeves; and

a thermal shrinking tube covering said thermal melting adhesive sleeve.

4,812,009

OPTICAL FIBER CONNECTOR

Arthur W. Carlisle, Dunwoody; Bruce V. Darden, Lawrenceville, and Clyde J. Myers, Stone Mountain, all of Ga., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 30, 1987, Ser. No. 68,585
Int. Cl.[4] G02B *6/38*
U.S. Cl. 350—96.21 **29 Claims**

1. An optical fiber connector for connecting an optical fiber of an optical fiber cable to optical means, said connector comprising:

a plug assembly which includes an entrance end for an optical fiber cable comprising an optical fiber and a connection end, a plug adapted to terminate an optical fiber, a cap which is assembled to said plug, and resilient means for urging said plug outwardly of said cap in a direction away from said optical fiber entrance end, said plug assembly adapted to be connected to optical means at said connection end;

sleeve means for receiving said plug of said plug assembly in one end thereof and an optical means disposed adjacent to

said plug to cause the optical fiber terminated by said plug to become connected operatively to the optical means; and

extender means attached to said plug assembly at the optical fiber cable entrance end for transferring bending forces applied to the optical fiber cable adjacent to the optical fiber cable entrance end to said cap instead of to said plug thereby limiting relative angular movement between said plug and the optical means to prevent optical disconnection therebetween.

4,812,010

APPARATUS FOR ARRANGING A PLURALITY OF COATED OPTICAL FIBERS AND COLLECTIVE FUSION SPLICING METHOD USING THE APPARATUS

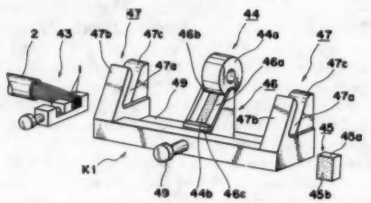
Keiji Osaka; Toru Yanagi, and Yasuo Asano, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 2, 1988, Ser. No. 151,643

Claims priority, application Japan, Feb. 6, 1987, 62-26778; Sep. 25, 1987, 62-240217; Sep. 25, 1987, 62-240218

Int. Cl.[4] G02B *6/40, 6/38*

U.S. Cl. 350—96.22 **19 Claims**



10. An apparatus for arranging a plurality of coated optical fibers at a predetermined interval in a plane, comprising:

a positioning means for positioning said coated optical fibers said positioning means comprising a slot for placing the coated optical fibers thereon, a guide member for introducing the coated optical fibers into said slot, which is provided along said slot, a plurality of positioning members for positioning said coated optical fibers, said fibers provided at one end portion of said slot, a rotational plate for temporarily holding, through sequential rotation thereof said coated optical fibers accommodated and arranged in said slot by said positioning members;

a fixing means for temporarily fixing distal end portions of said coated optical fibers arranged by said positioning means; and

a tape supply means for supplying in a direction substantially perpendicular to an optical axis of said coated optical fibers, an adhesive tape to secure said the coated optical fibers arranged by said positioning means, with an adhesive face of said adhesive tape confronting said slot.

4,812,011

OPTICAL FIBER COMPRISING A METHACRYLATE POLYMER CORE AND A FLUORO POLYMER CLADDING

Yoshiharu Tatsukami, Toyonaka; Toshiki Doi, Ibaraki, and Masahiko Oka, Ohtsu, all of Japan, assignors to Sumitomo Chemical Co. and Daikin Industries Ltd., both of Osaka, Japan

Continuation of Ser. No. 709,106, Mar. 6, 1985, abandoned. This application Mar. 18, 1987, Ser. No. 28,008

Claims priority, application Japan, Mar. 6, 1984, 59-43649

Int. Cl.[4] G02B *6/16*

U.S. Cl. 350—96.34 **12 Claims**

1. An optical fiber comprising a core and cladding, wherein the core is made of a copolymer comprising at least 60% by mole of units of methyl methacrylate and units of a methacrylic ester the ester moiety of which has an alicyclic hydrocarbon group having more than 8 carbon atoms, and the cladding is made of a copolymer consisting essentially of units of vinylidene fluoride and 0.5 to 7% by mole of units of hexafluoropropene.

4,812,012

OPTICAL FIBER ARRAY HAVING FIBER ISLANDS IN A POLYMER SEA

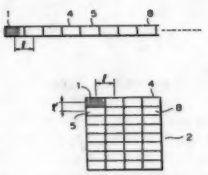
Hiromu Terada; Kenichi Sakunaga, both of Otake, and Naoyuki Fukahori, Ayase, all of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Filed Dec. 2, 1987, Ser. No. 127,415

Claims priority, application Japan, Dec. 12, 1986, 61-294721

Int. Cl.[4] G12B *6/04*

U.S. Cl. 350—96.24 **6 Claims**



1. An optical fiber array comprising:

a plurality of multifilament type plastic optical fibers having a substantially rectangular peripheral sectional shape and including 10 to 10,000 light-transmitting islands having a diameter of 5 to 200 microns;

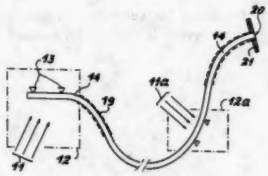
a sea component wherein said multifilament type plastic optical fibers are densely arranged in said sea component and wherein one end of the multifilament type plastic optical fibers are arranged in one of a single line and a plurality of lines and wherein the other end of said fibers are integrated in one of a substantially rectangular and substantially circular shape.

4,812,013

PROCESS FOR UTILIZING LIGHT RADIATION WITH THE AID OF FLUORESCENT OPTICAL FIBRES AND FUNCTIONAL DEVICES AND APPARATUS USING SAID PROCESS

Claude Aurouet, Saint Michel sur Orge; Henry Blumenfeld, Gif sur Yvette; Michel Bourdinaud, Bures sur Yvette; Jean Calvet, Paris; Jean-Claude Cavan, Vincennes; Joao Meyer, Paris, and Jean-Claude Thevenin, Velizy, all of France

Division of Ser. No. 806,610, Dec. 9, 1985, Pat. No. 4,753,512.
This application Dec. 22, 1987, Ser. No. 136,773
Claims priority, application France, Dec. 10, 1984, 84 18831
Int. Cl.[4] G02B *6/02, 6/00;* G01T *1/20;* G01F *23/00*
U.S. Cl. 350—96.29 3 Claims



1. A process for the utilization of at least one source of light radiation in at least one space traversed by the light radiation comprising:

providing at least one fluorescent optical fibre having a transparent core and sheath, and having two ends;

placing in the space part of the fluorescent fibre in a position such that the fluorescent fibre can be laterally excited by the light radiation such that a light signal is produced by fluorescence within the fibre and conveyed to the ends; and

positioning a functional element at least one end of the fibre for utilization of the light signal corresponding to lateral excitation of the fibre; and

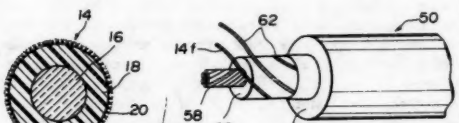
wherein the laterally excitable fibre part can be exposed to the flux of a single point source and wherein the end of the fibre ensures a binary function of indicating the operating or non-operating state of said source.

4,812,014

WATER PENETRATION-DETECTING APPARATUS AND OPTICAL FIBER CABLE USING SAME

Hiroyuki Sawano, Sakura; Hideo Suzuki, Funabashi; Yasuyuki Sugawara, Chiba; Kazunaga Kobayashi, Sakura, and Nobuyasu Sato, Funabashi, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed May 6, 1987, Ser. No. 47,357
Claims priority, application Japan, May 9, 1986, 61-106290; May 9, 1986, 61-106291; May 9, 1986, 61-106292; Mar. 20, 1987, 62-67108; Mar. 20, 1987, 62-67109
Int. Cl.[4] G01N *21/88;* G02B *6/44*
U.S. Cl. 350—96.29 15 Claims



14. An optical fiber cable comprising:

(a) a sheath;

(b) a plurality of communication optical fibers mounted within said sheath;

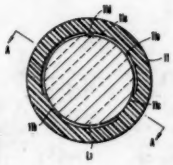
(c) an optical fiber sensor mounted within said sheath and comprising (i) an optical fiber, and (ii) a water-absorbent material disposed along said optical fiber of said sensor in contiguous relation thereto, said water-absorbent material, when absorbing water, expanding volumetrically so as to apply a pressure to an outer peripheral surface of said optical fiber of said sensor to bend said fiber, said optical fiber sensor being adapted to be connected to a detecting means for detecting a bending of said optical fiber of said sensor.

4,812,015

LENS BARREL

Toshimi Iizuka, Kanagawa, and Shigeru Kawata, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 2, 1986, Ser. No. 847,206
Claims priority, application Japan, Apr. 2, 1985, 60-048199[U]; Apr. 11, 1985, 60-052849[U]
Int. Cl.[4] G02B *7/02*
U.S. Cl. 350—252 6 Claims



5. A lens barrel comprising:

(a) a plurality of lenses; and

(b) a holding member made of plastic material to hold said lenses, said holding member being formed into a tubular shape and having a diameter of its inner diametric portion formed somewhat larger than a diamter of said lenses, said holding member further having fit portions which inwardly protrude in a radial direction angularly spaced less than 180° apart on said inner diameter portion, said fit portions further being formed at two places on said inner diametric portion in parallel with the optical axis and having a smooth axial length and a smooth non-threaded cylindrical circumferential width such that said plurality of lenses each make contact with said fit portions at circumferential surfaces of all of the plurality of lenses, a projected portion being formed at a place positioned opposingly to said fit portions on said inner diametric portion, said projected portion having an axial length and being deformed when said lenses are pressed into said holding member for pressing all of said plurality of lenses against said fit portions.

4,812,016

ANTIREFLECTION FILM

Takeo Miyata; Takuhiro Ono, both of Zama; Takashi Iwabuchi, Sagamihara; Masaru Ikedo, Ikoma, and Masafumi Watari, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 783,090, Oct. 2, 1985, Pat. No. 4,738,497.
This application Aug. 14, 1987, Ser. No. 85,199
Claims priority, application Japan, Oct. 5, 1984, 59-209107; Nov. 14, 1984, 59-239842
Int. Cl.[4] G02B *1/10, 5/28*
U.S. Cl. 350—320 4 Claims

1. A method of operating a laser comprising the steps of:

generating a laser beam;

providing an optical component in an atmosphere of dry air or dry inert gas;

irradiating said optical component with said laser beam, said

optical component being provided with an optical film through which said laser beam passes, which comprises at

least a layer of calcogenide glass and a layer of potassium chloride or lead fluoride.

4,812,017

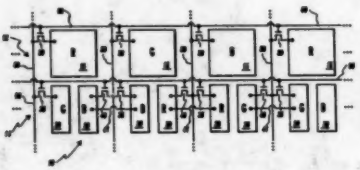
PIXEL CONFIGURATION TO ACHIEVE A STAGGERED COLOR TRIAD WITH INSULATED CONNECTION BETWEEN THIRD, SPLIT PIXEL ELECTRODES

William W. Piper, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 28, 1987, Ser. No. 138,167

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—333 **6 Claims**



1. An arrangement of pixel electrodes for two adjacent rows in a color panel display, said arrangement comprising:

a first row of pixel electrodes, said pixel electrodes being associated with adjacently disposed color filters which exhibit a repeated pattern of a predetermined sequence of three colors;

a second row of pixel electrodes disposed adjacent to said first row, said second row possessing twice as many pixel electrodes, with each such electrode having approximately half the width of the adjacent pixel electrode in said first row, said pixel electrodes in said second row being disposed in pairs with each pair being adjacent to and substantially aligned with a pixel electrode in said first row, said pixel electrodes in said second row being associated with adjacently disposed color filters exhibiting, in pairs, the same predetermined sequence of colors as in said first row, said sequence of color filters in said second row being shifted so that three distinct color filters are present for each set of pixel electrodes which set includes a pixel electrode from the first row and the two substantially aligned adjacent pixel electrodes from said second row; and

means for simultaneously driving pixel electrodes of said second row which are horizontally adjacent and which are associated with the same color filter, and including an insulated electrical conductor extending between said horizontally adjacent pixels.

4,812,018

LIQUID CRYSTAL DISPLAY ELEMENT HAVING ALIGNMENT FILM FORMED OF PLASMA-POLYMERIZED ACETONITRILE

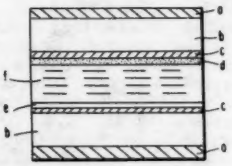
Shunsuke Kobayashi, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 28, 1988, Ser. No. 174,309

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—341 **8 Claims**

1. A liquid crystal display element which comprises a pair of transparent electrode bases, each comprised of a transparent electrode, an alignment layer on each of the bases, said bases facing each other with the alignment layer thereof being inside,



and a liquid crystal sealed between the bases, in which at least one of the alignment layers is formed by plasma polymerization of acetonitrile.

4,812,019

METHOD FOR PRODUCING THE FIRST DIFFERENTIAL OF A TWO-DIMENSIONAL IMAGE AND OPTICAL STRUCTURAL ELEMENT FOR PERFORMING THE METHOD

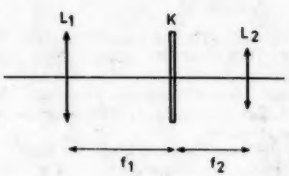
Klaus Dietrich, and Anton Harasim, both of Munich, Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 13, 1985, Ser. No. 775,594

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1984, 3434388

Int. Cl.[4] G02F *1/01, 1/135*

U.S. Cl. 350—355 **10 Claims**

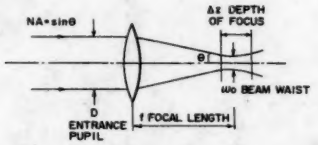


1. An optical contour filter for differentiating a two-dimensional image represented by incident light, comprising a plurality of discrete light sensitive detector elements arranged in a mosaic fashion to form a detector array for receiving said incident light, a layer (M) of electro-optically active material capable of changing its transparency in response to an influence, said layer of electro-optically active material being arranged for cooperation with said detector array for displaying a differentiated contour image of said two-dimensional image, electrode means including discrete electrode elements each cooperating with its respective light sensitive detector element for generating a potential difference between neighboring electrode elements in response to a change in the intensity of the light incident on neighboring discrete light sensitive detector elements, said potential difference causing a change in said transparency of said electro-optically active material, so that said contour filter directly provides at its output a differentiated contour image.

4,812,020
OPTICAL INFORMATION RECORDING AND REPRODUCING APPARATUS

Kiyonobu Endo, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1988, Ser. No. 195,090
Claims priority, application Japan, May 20, 1987, 62-124956
Int. Cl.[4] G02B 3/00
U.S. Cl. 350—409 3 Claims



1. An optical information recording and reproducing apparatus comprising:

a laser light source having a Gaussian intensity distribution of an emitted laser beam;

an optical system for focusing the laser beam emitted from said laser light source, having a number of aperture NA represented by

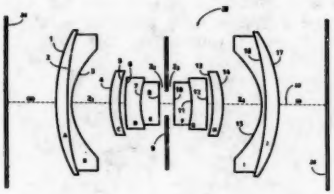
$$NA > \frac{0.82 \times \lambda}{\omega_0}$$

where λ is a wavelength of the laser beam emitted by said laser light source, and ω_0 is a diameter of a laser beam spot focused by said optical system.

4,812,021
WIDE ANGLE ZOOM LENS

Michael E. Harrigan, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 7, 1987, Ser. No. 105,779
Int. Cl.[4] G02B 15/00, 9/62
U.S. Cl. 350—425 3 Claims



1. A wide angle zoom lens having a half field angle exceeding 35° movably located between an object and image plane comprising a plurality of lens elements arranged along an optical axis and on both sides of a central stop defining a central air space therebetween, said lens elements arranged into two moveable outer lens groups having negative refractive power and two moveable inner lens groups having positive refractive power, each inner lens group separated from the outer lens group by a first zoom space and from the aperture stop by a second zoom space, wherein, as said zoom lens changes its vertical location between said object and image planes, resulting in a magnification change, said inner and outer lens groups are moveable so as to change the first zoom spaces to adjust the lens focal length change and to change the second zoom space so as to compensate for astigmatism and field curvature variation, said zoom lens made substantially according to the following specification:

TABLE I

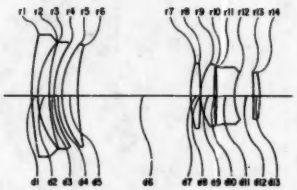
WIDE ANGLE LENS SURFACE DATA

SURFACE	RADIUS (mm)	THICKNESS (mm)	GLASS
1	82.8800	8.014(A)	FD10
2	174.4465	2.500(B)	LaCL6
3	39.6745	Zoom Space Z_1	AIR
4	66.4647	6.186(C)	NbFD10
5	164.0424	2.278	AIR
6	358.5615	13.898(D)	FD5
7	37.4018	16.905(E)	LaCL2
8	Plano	Zoom space Z_2	AIR
9	Aperature Stop	Zoom Space Z_3	AIR
10	Plano	16.905(F)	LaCL2
11	−37.4018	13.898(G)	FD5
12	−358.5615	2.278	AIR
13	−164.0424	6.186(H)	NbFD10
14	−66.4647	Zoom Space Z_4	AIR
15	−39.6745	2.500 (I)	LaCL6
16	−174.4465	8.014(J)	FD10
17	−82.8800		
	$Z_4 = Z_1$ AND	$Z_3 = Z_2$	

4,812,022
ZOOM LENS

Shigetada Sato, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 569,466, Jan. 9, 1984. This application Jun. 27, 1988, Ser. No. 212,297
Claims priority, application Japan, Feb. 2, 1983, 58-15885
Int. Cl.[4] G02B 15/00
U.S. Cl. 350—426 1 Claim



1. A zoom lens comprising a front diverging lens group and a rear converging lens group which are mechanically movable for variable power, said front diverging lens comprising a first lens of negative meniscus which is convex toward an object, a second negative lens, and a third lens of positive meniscus which is convex toward the object, said rear converging lens comprising a fourth positive lens, a fifth positive lens, a sixth negative lens, and a seventh positive lens, there being an aperture disposed between the front lens group and the rear lens group and movable with said rear group, said zoom lens satisfying the following conditions:

$$\frac{1}{f1, 2\left(\frac{1}{n1\,f1} + \frac{1}{n2\,f2}\right)} > 1.80 \quad (1)$$

$$1.20 > \frac{|f1|}{f_T} > 0.90 \quad (2)$$

$$1.10 > \frac{\beta}{|f1|} > 0.75 \quad (3)$$

$$0.55 > \frac{|f5|}{f_{II}} > 0.35 \quad (4)$$

$$0.050 > \frac{h_2}{f_T} > 0.025 \quad (5)$$

-continued

$$0.25 > \frac{e}{f_T} > 0.15 \quad (6)$$

where

f_T: the combined focal length of the entire lens system at a maximum focal length,

f_F: the combined focal length of the front group,

f_{IF}: the combined focal length of the rear group,

f1, 2: the combined focal length from the first to the second lens,

f1, f2, f3, f6: the focal lengths of the first, second, third, and sixth lenses,

n1, n2: the refractive indexes of the first and second lenses with respect to d-line,

l2: the air gap between the second and third lenses, and

e: the distance between a principal point of the front group closer to the image and a principal point of the rear group closer to the object at a maximum focal length.

4,812,023

ZOOM FINDER

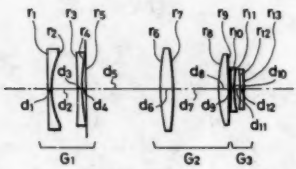
Juro Kikuchi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 20, 1987, Ser. No. 17,076

Claims priority, application Japan, Feb. 21, 1986, 61-35019

Int. Cl.[4] G02B *15/14, 13/18;* **G03B** *13/20, 13/10*

U.S. Cl. 350—427 **8 Claims**



1. A zoom finder comprising:

a system for forming an image of a measuring field frame, said system including a semitransparent mirror; and

a vari-focal lens system, said measuring field frame forming system and said vari-focal lens system being formed in that order from the object side of the zoom finder.

4,812,024

ZOOM LENS

Hitoshi Mukaiya, Saitama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1988, Ser. No. 190,472

Claims priority, application Japan, May 11, 1987, 62-279831; May 11, 1987, 62-279832; May 18, 1987, 62-120724; May 18, 1987, 62-120725

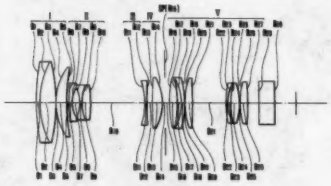
Int. Cl.[4] G02B *15/14*

U.S. Cl. 350—427 **2 Claims**

1. A zoom lens comprising, from front to rear, a first lens unit of positive refractive power for focusing, a second lens unit of negative refractive power having the image magnification varying function, a third lens unit of negative refractive power for compensating for the shift of an image plane resulting from the variation of the image magnification, a fourth lens unit of positive refractive power for making afocal the diverging light beam from said third lens unit, and a fifth lens unit having the image forming function, said fifth lens unit including, from front to rear, a first lens of which both lens surfaces are convex and which turns its strong refracting surface toward the front, a negative meniscus-shaped second lens concave toward the front, a positive third lens turning its strong refracting surface toward the front, a negative meniscus-shaped fourth lens convex toward the front, a fifth lens of which both lens surfaces are convex and which turns its strong refracting surface toward the rear, and a positive sixth lens turning its strong refracting surface toward the front, wherein the following conditions are satisfied:

$1.45 < F_1/F_4 1.65$

$2.5 < F_4/Fw < 2.8$



$0.75 < |f_{5,4}/F_5| < 1.3$

$0.47 < D_{5,6}/F_5 < 0.65$

where F_1, F_4 and F_5 are the focal lengths of said first, said fourth and said fifth lens units respectively, Fw is the shortest focal length of the entire system, $f_{5,4}$ is the focal length of said fifth lens, and $D_{5,6}$ is the air separation between said third and said fourth lenses.

4,812,025

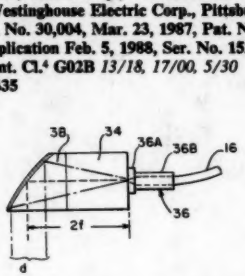
OPTICAL INTERFACE FOR A MAGNETO-OPTICAL CURRENT TRANSDUCER

Robert C. Miller, Salem Twp., Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 30,004, Mar. 23, 1987, Pat. No. 4,745,357. This application Feb. 5, 1988, Ser. No. 152,786

Int. Cl.[4] G02B *13/18, 17/00, 5/30*

U.S. Cl. 350—435 **9 Claims**



1. An optical interfacing device for communicating a light signal to a light operative device, comprising:

a spacer lens element receptive of such light signal;

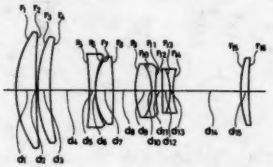
a collimator segment having a surface formed in the shape of a paraboloid of revolution is connected to said spacer lens segment and is effective such that, such light signal which enters said collimator segment as a divergent bundle of light, is focussed by a parabolic surface associated with said paraboloid of revolution into a parallel beam of light; and

said spacer lens element and said collimator segment, when connected, form a collimating lens element having a monolithic configuration and which is connected to said light operative device such that said parallel beam of light is directed thereto.

4,812,026
TELEPHOTO LENS SYSTEM

Mitsunori Iima, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 8, 1988, Ser. No. 153,683
Claims priority, application Japan, Feb. 6, 1987, 62-26787
Int. Cl.[4] G02B 13/02, 9/64
U.S. Cl. 350—454 6 Claims



1. In a telephoto lens system which comprises, in order from the object side, a first lens group having a positive refractive power, a second lens group having a positive refractive power and a third lens group having a negative refractive power the improvement wherein said first lens group comprises a positive first lens element, a positive second lens element, a negative third lens element and a positive fourth lens element; the second lens group is composed of a cemented positive lens comprising a positive fifth lens element cemented to a negative sixth lens element; and the third lens group a cemented negative lens comprising a positive seventh lens element cemented to a negative eighth lens element, and a positive meniscus ninth lens element having a convex surface directed toward the object side, said lens system further satisfying the following conditions:

(1) $0.2<f_{1,2}/f<0.4$
(2) $0.4<f_{1,2,3,4}/f<0.6$
(3) $25<\nu_{IP}-\nu_{IN}$
(4) $5.5<|r_5/r_6|<7.0$
(5) $-2.2<\{(n_6/n_5)/r_{10}\}\cdot f<-1.3$

wherein

f: focal length of the overall system
$f_{1,2}$: composite focal length from the first to second lens element
$f_{1,2,3,4}$: composite focal length from the first to fourth lens element
ν_{IP}: means average of the Abbé numbers of the positive lens elements in the first lens group
ν_{IN}: mean average of the Abbé numbers of the negative lens elements in the first lens group
r_i: radius of curvature of the ith surface counted from the object side; and
n_i: refractive index at the d line of the ith lens element.

4,812,027
GAUSS TYPE NEAR FOCUS LENS

Masaaki Yanagisawa, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Jun. 14, 1988, Ser. No. 206,292
Claims priority, application Japan, Jun. 19, 1987, 62-152653; Sep. 18, 1987, 62-234389
Int. Cl.[4] G02B 9/64, 9/62
U.S. Cl. 350—463 8 Claims

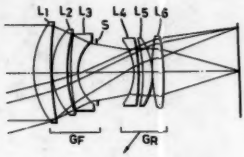
1. A Gauss type rear focus lens including:

a forward group having, in succession from the object side, a first lens component having its convex surface facing the object side and having a positive refractive power, a second lens component comprised of at least one lens and having a positive refractive power, and a third lens component having its sharply concave surface facing the image side and having a negative refractive power, said forward group having a positive refractive power as a whole; and

a rearward group disposed on the image side relative to said forward group, said rearward group having a fourth lens having its sharply concave surface facing the object side and having a negative refractive power, a fifth lens having its sharply convex surface facing the image side and having a positive refractive power, and a sixth lens having a positive refractive power, said rearward group having a positive refractive power;

wherein during the focusing from infinity to a short distance, said rearward group is moved along the optic axis, and the following conditions are satisfied:

$0.3<l/f<0.4$



$0.7<f_R/f<0.9$

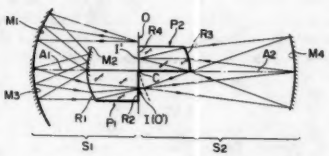
$0.4<Hex/Hin<0.6$

where f is the focal length of the entire system, f_R is the focal length of said rearward group, l is the air space between said forward group and said rearward groups during infinity, Hin is the height at which a land light ray of the greatest incidence height passes through the first surface of said forward group, and Hex is the height at which the land light ray of the greatest incidence height passes through the first surface of said forward group and leaves the last surface of said rearward group.

4,812,028
REFLECTION TYPE REDUCTION PROJECTION OPTICAL SYSTEM

Kohichi Matsumoto, Kita, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 755,356, Jul. 16, 1985, abandoned. This application Mar. 21, 1988, Ser. No. 171,169
Claims priority, application Japan, Jul. 23, 1984, 59-152502; Mar. 6, 1985, 60-44123
Int. Cl.[4] G02B 17/08
U.S. Cl. 350—444 15 Claims



1. A reflection type projection optical system, comprising:

(a) an optical axis; and

(b) a plurality of optical surfaces having respective centers of curvature on said optical axis, said plurality of optical surfaces being arranged such that an image point determined by a preceding one of said optical surfaces serves as an object point for a next one of said optical surfaces in an optical order from an object to a final image point;

(c) said plurality of optical surfaces including a plurality of reflecting surfaces and a plurality of refracting surfaces having at least one aplanatic refracting surface;

the centers of curvature of said plurality of reflecting surfaces being substantially coincident with object points for corresponding reflecting surfaces along said optical axis, the centers of curvature of said refracting surfaces other than said aplanatic refracting surface being substantially coincident with object points for corresponding refracting surfaces along said optical axis.

4,812,029

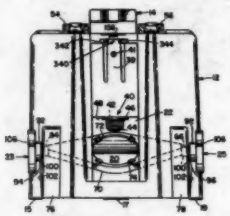
MICROSCOPE SYSTEM

Richard A. Ossanhian, 85 Irving St., Arlington, Mass. 02174

Filed Feb. 19, 1987, Ser. No. 16,580

Int. Cl.[4] G02B *21/00*

U.S. Cl. 350—523 **16 Claims**



1. A microscope system comprising:

a base including an integral stage section for holding a specimen to be viewed and further including integral guide means and an inner cavity for accessing a source of light;

an eyepiece section for holding a lens and including integral bearing means for movably engaging said guide means;

a stage hole in said stage section and a lens in said eyepiece section which is aligned with stage hole;

means integrally formed in said stage section for holding a specimen in registration with said stage hole;

means for finely adjusting the position of said eyepiece section relative to said base to adjust the focus of said lens;

means within said cavity, for gathering and directing light through said stage hole to the specimen being viewed;

angularly adjustable means for mounting said means for gathering and directing light to aids base;

said means for mounting including at least one knob means for adjusting the angle of said means for gathering and directing light;

a pair of opposing slots in said base for receiving said means for mounting; and

resilient locking means including at least one resilient convex portion biased into an extended condition and being engageable with said knob means for snuggly restraining said means for mounting in said slots and for permitting removal of said means for mounting from said slots.

4,812,030

CATOPTRIC ZOOM OPTICAL DEVICE

George T. Pinson, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 688,535, Jan. 3, 1985, abandoned. This application Nov. 12, 1986, Ser. No. 929,356

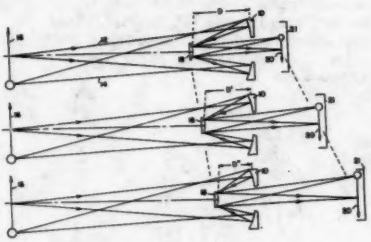
Int. Cl.[4] G02B *5/10, 17/06, 7/18, 15/16*

U.S. Cl. 350—620 **14 Claims**

1. A catoptric zoom optical device comprising:

reflector set means for transforming received object energy into a real image of said object, said set, means including a plurality of axially-spaced fixed focal length reflectors for receiving and reflecting said energy;

magnifying means for selectively varying the focal length of said reflector set means; and



focusing means for selectively varying the axial distance between said reflector set means and a detector for said image.

4,812,031

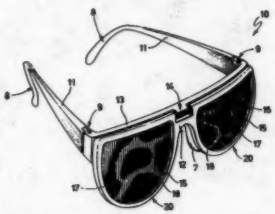
CAMOUFLAGE EYEGLASSES

Tony Evans, 5672 Fawn Dr., Powder Springs, Ga. 30073

Filed Dec. 8, 1987, Ser. No. 130,010

Int. Cl.[4] G02C *7/16, 9/00*

U.S. Cl. 351—46 **12 Claims**



1. A pair of camouflage eyeglasses for concealing a hunter's eyes from wild game, said eyeglasses comprising:

a frame including a front frame portion defining a pair of substantially annular eye encircling rims and a bridge portion interconnecting said rims each of said rims having a groove formed around the inner circumference thereof;

a pair of elongated temple elements hingedly attached to said frame with each temple element adapted to extend adjacent a temple and over an ear of a wearer;

means for concealing a hunter's eyes from wild game, said means comprising an open weave netting formed from a first plurality of spaced apart strands of material and a second plurality of spaced apart strands of material, said first strands to define openings therebetween with the strands being spaced to conceal a hunter's eyes from potential prey while allowing the hunter to see through said openings; and

mounting means for mounting said netting to said front frame portion, said mounting means comprising a pair of wire frames having a size and shape substantially corresponding to the size and shape of said rims, said netting being mounted to said wire frames and said wire frames being removably mounted to said rims within said grooves.

4,812,032

HIGHLY-REFRACTIVE PLASTIC LENS

Tadanori Fukuda, Otsu; Sadayuki Sakamoto, Shiga, and Masami Saito, Osu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 20,156, Feb. 25, 1987, Pat. No. 4,721,377.
This application Dec. 15, 1987, Ser. No. 133,476
Int. Cl.[4] G02C 7/02
U.S. Cl. 351—159 4 Claims

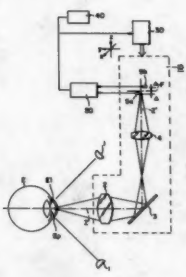
1. A plastic lens which comprise a copolymer of (A) 20 to 85 percent by weight of dibromostyrene with (B) 15 to 80 percent by weight of divinylbenzene and (C) less then 60 percent by weight of mono-acrylate, or mono-methacrylate having a nucleous-halogen substituted aromatic ring, said copolymer being in the form of a lens.

4,812,033

OPHTHALMIC APPARATUS

Yasuyuki Ishikawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 2, 1987, Ser. No. 33,207
Claims priority, application Japan, Feb. 26, 1985, 60-036789; Apr. 11, 1986, 61-083462
Int. Cl.[4] A61B 3/14
U.S. Cl. 351—208 19 Claims



1. An ophthalmic apparatus having:

an objective optical system having an optical axis and being opposed to an eye to be examined;

first and second photodetectors provided on a substantially conjugate plane of an iris of the eye to be examined with respect to said objective optical system when the operating distance to the eye to be examined is appropriate, said first and second photodetectors detecting the image of an inner edge of the iris; and

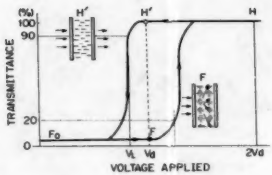
detecting means for comparing the outputs of said first and second photodetectors to detect the state of alignment with the eye to be examined, wherein said first and second photodetectors are disposed at a predetermined interval in the direction of the optical axis, and the conjugate plane of the iris with respect to said objective optical system is coincident with an intermediate plane between light-receiving surfaces of said first and second photodetectors when the operating distance to the eye to be examined is appropriate.

4,812,034

PROJECTION TYPE LIQUID CRYSTAL DISPLAY DEVICE

Akihiro Mochizuki; Masayuki Iwasaki, both of Atsugi; Yasuo Yamagishi, Zama; Kasumi Ikegami, Sagamihara; Hiroyuki Gondo, Kawasaki, and Hisashi Yamaguchi, Atsugi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 832,897, Feb. 26, 1986, abandoned.
This application Dec. 21, 1987, Ser. No. 139,164
Claims priority, application Japan, Feb. 28, 1985, 60-037654
Int. Cl.[4] G03B 21/00
U.S. Cl. 383—122 4 Claims



1. A projection type liquid crystal display device, comprising:

a liquid crystal panel, comprising:

a first transparent substrate;

a second transparent substrate substantially in parallel with the first transparent substrate;

a spacer between the first and second transparent substrates, said first and second transparent substrates and said spacer forming an enclosed space, said first and second transparent substrates each having an internal surface facing the enclosed space;

first transparent electrode means formed on the internal surface of said first transparent substrate;

second transparent electrode means formed on the internal surface of said second transparent substrate;

a cholesteric-nematic phase transition type liquid crystal with positive dielectric anisotropy, charged in the enclosed space;

means for causing the liquid crystal at selected portions of the panel to be in a stable cholesteric phase and the liquid crystal at other portions of the panel to be in a stable nematic phase comprising (1) means for applying a voltage across the first and second electrodes sufficient to bring the liquid crystal in said panel to a stable nematic phase and (2) means for reducing the voltage applied across the first and second electrodes only at said selected portions of the panel to a level sufficiently low to bring the liquid crystal at said selected portions of the panel to a stable cholesteric phase; and

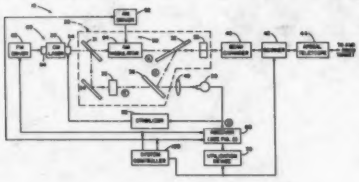
means for driving the liquid crystal panel to form a liquid crystal image composed of bistable cholesteric and nematic phases of said cholesteric-nematic phase transition type liquid crystal by applying a voltage across said first and second transparent electrodes at a level that is below the level required to cause cholesteric to nematic phase change in said crystal and above the level required to cause nematic to cholesteric phase change in said crystal, said formed liquid crystal image being projectable onto a projection area by an optical system.

4,812,035

AM-FM LASER RADAR

Nathan Freedman, West Newton; Wayne H. Keene, South Natick, and Albert V. Jelalian, Bedford, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Nov. 3, 1986, Ser. No. 929,686
Int. Cl.[4] G01C 3/08
U.S. Cl. 356—5 12 Claims



1. A laser radar system comprising:

means for generating a beam of continuous wave electromagnetic energy, said generating means comprising means for producing a frequency and amplitude modulated beam of continuous wave electromagnetic energy, such producing means comprising: means for modulating the frequency of such continuous wave beam from a nominal frequency; and means for modulating the amplitude of such continuous wave beam from a nominal amplitude at a reference envelope frequency f_m, said reference envelope having a reference phase;

means for directing said frequency and amplitude modulated beam of energy toward a target;

means for receiving portions of such directed beam of energy reflected by the target;

means, responsive to the frequency modulation of the received portions of the frequency and amplitude modulated beam of energy, for producing a first signal representative of the approximate range of the target; and

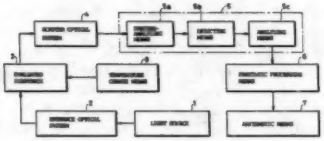
means responsive to the amplitude modulation of the received portions of the frequency and amplitude modulated beam of energy, for producing a second signal representative of variations in the approximate range of the target, said second signal producing means comprising: means, responsive to the received portions of target reflected energy, for producing a second amplitude modulated signal having a second envelope at the reference frequency f_m; and means for comparing the phase of the reference envelope and the second envelope, with the phase difference therebetween being representative of variations in the approximate range of the target.

4,812,036

STRESS EVALUATION APPARATUS

Yasuo Inoue, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 23, 1987, Ser. No. 132,618
Claims priority, application Japan, Jul. 8, 1987, 62-171606
Int. Cl.[4] G01B 11/16; G01J 3/44; G01N 21/65
U.S. Cl. 356—32 7 Claims



1. A stress evaluation apparatus for evaluating stress existing in a substance by difference between peak wave numbers of Raman spectra of scattered light, said stress evaluation apparatus comprising:

a light source for emitting excitation light;

an entrance optical system for guiding said excitation light to measuring points of a substance to be evaluated;

a scatter optical system for focusing scattered light from said measuring points;

scattered light measuring means for measuring peak wave numbers in Raman spectra of said scattered light;

temperature change means for changing temperatures of said measuring points;

statistic processing means for statistically processing a plurality of measured values of a peak wave number varied with temperature change of each said measuring point per said measuring point; and

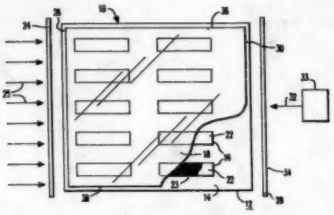
arithmetic means for deciding relation between temperature change of said measuring points and variation in peak wave number on the basis of statistic values calculated by said statistic processing means thereby to obtain a peak wave number at a prescribed reference value.

4,812,037

METHOD AND APPARATUS FOR OPTICALLY DETECTING CIRCUIT MALFUNCTIONS

Ernest P. Riedel, Murrysville, Pa., and Robert A. Boenning, Timonium, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 11, 1988, Ser. No. 166,946
Int. Cl.[4] G01N 21/23
U.S. Cl. 356—35 10 Claims



6. An apparatus for optically detecting electronic circuit malfunctions comprising:

a sheet of optical material which exhibits stress induced birefringence;

means for positioning said optical material adjacent to an electronic circuit;

means for directing a polarized light beam onto a first edge of said optical material, such that said light beam passes through said optical material;

a polarizing filter positioned adjacent to an opposing edge of said optical material, said polarizing filter receiving said light beam emitted from said opposing edge of said optical material and producing a striated pattern of light, representative of the temperature distribution in said optical material; and

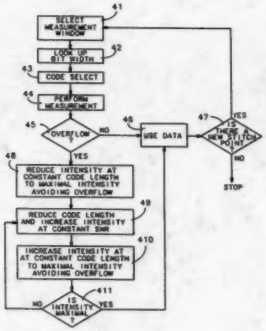
means for comparing said striated pattern of light with a predetermined reference pattern of light to detect differences in said patterns, said differences identifying a malfunction in said electronic circuit.

4,812,038

ADAPTIVE SELECTION OF OTDR TEST PARAMETERS AND THE FUSION OF DATA TAKEN FROM SUCCESSIVELY SHRINKING MEASUREMENT SPANS

Moshe Nazarathy, Mountain View; Steven A. Newton, Belmont, and Scott H. Foster, LaHonda, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 21, 1987, Ser. No. 5,993
Int. Cl.[4] G01N 21/84
U.S. Cl. 356—73.1 11 Claims



1. A method of selecting a code length of a test signal generated by a test instrument to test a device under test and of selecting an intensity of detected return signal produced in response to said test signal, said method comprising the steps of:

(a) transmitting a coded test signal to the device under test and measuring, in an initial measurement window, a return signal from the device under test produced in response to the test signal;

(b) determining whether an overflow of the measurement circuitry of the test device has occurred in step (a);

(c) if an overflow condition is detected, making a new selection of code length and intensity having a reduced energy per test signal; and

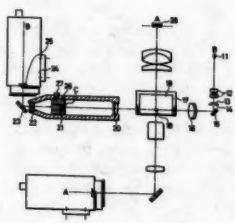
(d) repeating step (c) until code length and intensity values are found that avoid overflow during step (b).

4,812,039

SCHLIEREN OPTICAL DEVICE

Yoshihiro Shimada; Tadafumi Fujihara; Chikara Nagano, all of Tokyo, and Katsuo Tsukamoto, Sendai, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1987, Ser. No. 108,934
Claims priority, application Japan, Oct. 16, 1986, 61-246189
Int. Cl.[4] G01N 21/41
U.S. Cl. 356—129 11 Claims



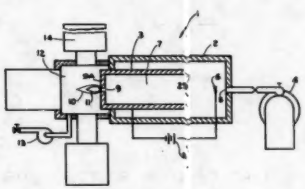
1. A schlieren optical device comprising a spot light source, a first schlieren lens for making the rays emitted from said light source into parallel rays, a second schlieren lens for converging said parallel rays after having passed through a sample, a knife edge arranged at the position of the rear focal point of said second schlieren lens and an imaging lens for forming an image of said sample, wherein said spot light source emits monochromatic light and said imaging lens consists of a first lens group arranged at the position of the rear focal point of said second schlieren lens and a second lens group arranged with an airspace after said first lens group.

4,812,040

HOLLOW CATHODE PLASMA PLUME

R. Kenneth Marcus, and W. W. Harrison, both of Charlottesville, Va., assignors to The University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Continuation of Ser. No. 725,348, Apr. 19, 1985, abandoned.
This application Mar. 27, 1987, Ser. No. 31,212
Int. Cl.[4] G01J 3/10
U.S. Cl. 356—314 5 Claims



1. An analytical method comprising,

flowing gas through an inlet port over an anode and into an open proximal end of a hollow cathode,

ionizing a gas in the hollow cathode and passing the ionized gas outwardly through an orifice in a base at a distal end of the hollow cathode, the ionized gas sputtering sample material from the base near the orifice, the sputtered material and ionized gas forming a plume outside the distal end of the hollow cathode in an analyzer chamber, wherein sputtered material is ionized and excited in the plume outside of the hollow cathode, and

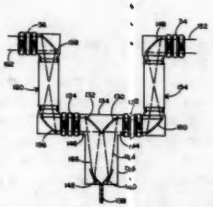
optically analyzing the sample material in the plume.

4,812,041

SPECTROMETER SYSTEM HAVING PIVOTALLY MOUNTED INTERNAL REFLECTANCE ELEMENT

Walter M. Doyle, Laguna Beach, Calif., assignor to Laser Precision Corporation, Irvine, Calif.

Filed Feb. 26, 1988, Ser. No. 161,007
Int. Cl.[4] G01B 9/02; G01J 3/45
U.S. Cl. 356—346 8 Claims



1. In a spectrometer system having an interferometer which provides pre-sample radiation and a detector which receives post-sample radiation, a structure for illuminating samples by immersing an optical element therein, comprising:

a single ended internal reflectance element (IRE) adapted to be immersed in a sample;

a hollow enclosure which supports the IRE with the top of the IRE inside the enclosure and the body of the IRE projecting outside the enclosure for immersion in a sample;

a first means for directing an entering radiation beam into the enclosure;

a second means for directing an exiting radiation beam out of the enclosure;

the entering and exiting radiation beams being aligned with one another; and

means for pivotally mounting the enclosure to provide rotary movement of the enclosure around the aligned entering and exiting beams, in order to move the IRE into and out of a sample.

4,812,042

HOLOGRAPHIC INTERFEROMETER

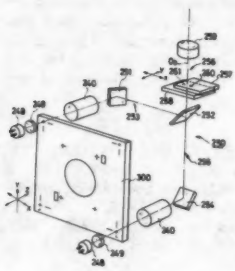
Takashi Yokokura, Hino; Takashi Gemma, Shibuya, and Takuji Satoh, Suginami, all of Japan

Division of Ser. No. 898,323, Aug. 20, 1986, Pat. No. 4,758,089. This application Sep. 11, 1987, Ser. No. 96,609

Claims priority, application Japan, Aug. 22, 1985, 60-184460; Aug. 22, 1985, 60-184461; Aug. 22, 1985, 60-184464

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—348 **10 Claims**



1. A method of setting a measurement hologram standard comprising the steps of:

locating an adjustment hologram standard having a first alignment mark at a predetermined position;

aligning an index on a reticle at an alignment optical system with said first alignment mark of said adjustment hologram standard;

removing said adjustment hologram standard from said predetermined position; and

locating a measurement hologram standard having a second alignment mark which is formed at a location geometrically equivalent to that of said first alignment mark in order that said second alignment mark be coincident with said index, such that said measurement standard can be located at said predetermined position.

4,812,043

METHOD FOR MEASURING A PHYSICAL QUANTITY PROVIDING DIGITAL DATA USING ANALOG-VALUE MEASURING DEVICES, AND MEASURING APPARATUS FOR APPLYING THIS METHOD

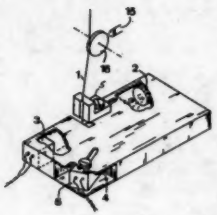
Roland Vanstaen, Kortrijk, Belgium, assignor to Barco Automation N.V., Poperinge, Belgium

Filed Dec. 23, 1986, Ser. No. 945,589

Claims priority, application European Pat. Off., Dec. 24, 1985, 85202134.4

Int. Cl.[4] G01B *11/04*

U.S. Cl. 356—385 **6 Claims**



1. An apparatus for measuring a width or thickness of moving yarn, a strip or the like comprising:

(a) a pin-point light source having a span substantially smaller than an average width or thickness of the yarn, strip, or the like to be measured, said pin-point light source disposed to strike directly, without interposing lenses, both:

(1) the yarn and a first sensor, the first sensor being located a predetermined distance from the yarn, strip or the like to be measured and having a sensitive plate of predetermined width, the predetermined distance and plate width being selected for obtaining a desired output measurement unit, and

(2) a second sensor, identical to the first sensor in characteristics relating to variations in sensitivity as a function of temperature and time, the light striking the second sensor without striking the yarn;

(b) an analog-to-digital converter having at least a pair of inputs and an output, one of the analog-to-digital converter inputs being a measuring input connected to an output of the first sensor and another analog-to-digital converter input being a reference input connected to an output of the second sensor, the output of the second sensor defining a variable threshold of the analog-to-digital converter;

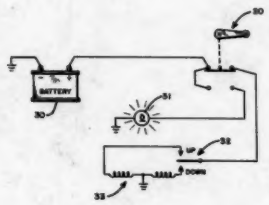
(c) an adjustable yarn-guiding device defining an exact position of the yarn, strip, or the like between the pin-point light source and the first sensor, the yarn guiding device cooperating with a signal generator producing sampling signals fed to the analog-to-digital converter so that the sampling rate of the analog-to-digital converter is determined by the speed at which the yarn, strip, or the like is fed so that sampling is effected for lengths smaller than a length projected onto the sensitive plate of the first sensor; and

(d) the output of the analog-to-digital converter representing a thickness of the yarn, strip or the like and being applied to a process and/or display device.

4,812,044
TAG AXLE ASSEMBLY WITH LIMIT SWITCH

Ronald E. Christenson, Mantorville, Minn., assignor to McNeilus Truck and Manufacturing, Inc., Dodge Center, Minn.

Filed Apr. 4, 1988, Ser. No. 177,321
Int. Cl.[4] B28C 5/26; B62D 61/10, 61/12
U.S. Cl. 366—54 5 Claims



1. In a concrete mixing vehicle of the type having a frame, a mixing drum supported by said frame and a distribution chute mounted to a linkage which is rotatably mounted to said frame, an improved tag axle assembly including:

(a) first and second support arms pivotally mounted to the frame;

(b) wheel means journaled for rotation on said first and second support arms;

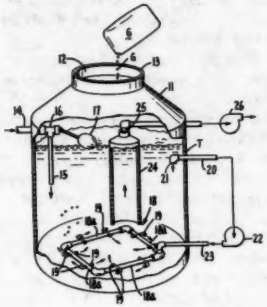
(c) means for moving said first and second support arms in unison between a ground engaging position of said wheel means and an elevated position; and

(d) limit means for precluding such movement of said first and second support arms except when said distribution chute is positioned so that it will not come into contact with said first and second support arms when they are moved, said limit means including a collar fixedly attached to said linkage and an electrical limit switch which is actuated by rotation of said collar.

4,812,045
GYPSUM DISSOLUTION SYSTEM

Jerry B. Rivers, Visalia, Calif., assignor to Domtar Gypsum Inc., Oakland, Calif.

Filed Aug. 20, 1987, Ser. No. 87,695
Int. Cl.[4] B01F 13/02
U.S. Cl. 366—107 11 Claims



1. A process for continuously preparing a gypsum solution for use in fertilizing plants and trees comprising:

introducing ground powdered gypsum of about 100 mesh particle size and a purity of at least about 90% into a tank of water of sufficient depth to provide a mixing zone in a lower region thereof and having a restricted quiescent zone extending from an upper region of the tank to a substantial depth therein,

vigorously agitating the mixture of gypsum and water in said lower region whereby some particles of the gypsum commence to go into solution and the remainder of the gypsum particles is formed into a slurry with the water,

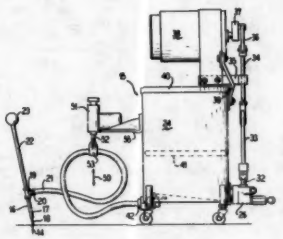
withdrawing the gypsum slurry with dissolved gypsum therein from the quiescent zone in the upper region of the tank while retaining in the bottom of the tank heavy insoluble components present in the granular gypsum feed, and

introducing the gypsum slurry into an irrigation system under conditions to permit all gypsum particles to be dissolved prior to discharge of gypsum solution from the irrigation system to a plant area to be irrigated.

4,812,046
DEVICE FOR MIXING TWO MATERIALS

Carl Henderickson, P.O. Box 81, Sheridan, Wyo. 82801

Filed Oct. 4, 1985, Ser. No. 784,114
Int. Cl.[4] B01F 5/00, 11/00
U.S. Cl. 366—111 6 Claims



1. A device for mixing at least two materials in a desired proportion and dispensing the materials under pressure from a nozzle, said device comprising a separate container for each of the materials, each container having means for discharging the contents of the container under pressure from a discharge tube, a mixing tube of flexible material having a discharge end and an inlet end, a nozzle attached to the discharge end, coupling means for coupling the discharge tubes of each of the containers into the inlet end of the mixing tube, a mixing element being disposed in the mixing tube and extending over a substantial length of said mixing tube said mixing element being flexible and loosely received in said mixing tube, and means for moving the mixing element relative to the mixing tube to stir the materials passing through the mixing tube, said means for moving engaging an outer surface of said mixing tube.

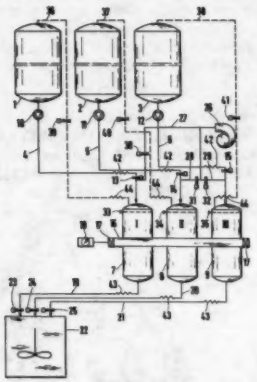
4,812,047
APPARATUS FOR THE GRAVIMETRIC DOSING OF FLOWABLE PRODUCTS

Rudolf Baumann, Osterburken, Fed. Rep. of Germany, assignor to Azo-Maschinenfabrik Adolf Zimmermann GmbH, Osterburken, Fed. Rep. of Germany

Filed Jun. 2, 1986, Ser. No. 869,241
Claims priority, application Fed. Rep. of Germany, Jun. 8, 1985, 3520657
Int. Cl.[4] B01F 15/02
U.S. Cl. 366—141 6 Claims

1. An apparatus for gravimetric dosing of a plurality of flowable product components, with at least one of the flowable product components being a liquid, for producing mixtures with optionally changing weight proportions of the flowable product components, the apparatus comprising a plurality of storage containers, each storage container containing one component of the plurality of flowable product components, means for mixing the flowable product components, a balance

means including a common weighing frame and weighing containers respectively connected to the storage containers through feed lines, said mixing means being connected to an outlet of the respective weighing containers, and shutoff valve means for interrupting each a component flow after a weighing process, wherein each weighing container is respectively connected to the mixing means by one feed line, all of the weighing containers are arranged in the common weighing frame of



the balance means and the shutoff valve means are located in the feed lines between the weighing containers and the mixing means and, after the common weighing frame determines the total weight in the weighing containers, the component are successively discharged in proportion in a mixing ratio by a subtraction process and wherein each weighing container is provided with a level meter means for providing an indication of a full level.

4,812,048

MATERIAL FEED DEVICE FOR AN EXTRUDER

Ulrich Neumann, Bad Oeynhausen, and Volkmar Wölfl, Vlotho/Valdorf, both of Fed. Rep. of Germany, assignors to Inoex GmbH Innovationen und Austrustungen Fur Die Extrusionstechnik, Bad Oeynnausen, Fed. Rep. of Germany

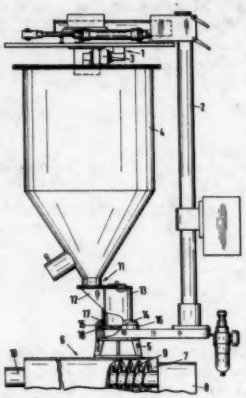
Filed Jan. 5, 1988, Ser. No. 141,035

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1987, 3705963

Int. Cl.[4] B01F *15/04*

U.S. Cl. 366—141 **7 Claims**

1. In a material feed device for an extruder, comprising a storage container acting as a weighing container of a mass throughput weighing device and suspended with provision for free movement from measuring members and discharging via tubular outlet into an inlet of a feed unit of the extruder, the outlet and inlet being sealed off from outside by a seal which enables the storage container to move freely, the improvement wherein the tubular outlet has an outer surface and the inlet has a flat sealing surface surrounding the tubular outlet and the seal comprises a rigid ring having a radially inner side with a sealing surface extending around the radial inner side bearing against the outer surface of the tubular outlet of the storage container to permit axial movement of the outlet relative to the ring and having an underside flat sealing ring surface bearing on the flat sealing surface of the inlet of the feed unit to permit



free movement of the ring relative to the inlet in the plane of the flat sealing surface.

4,812,049

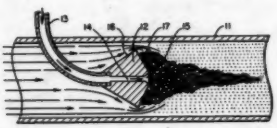
FLUID DISPERSING MEANS

Floyd McCall, 26031 Dumont Rd., Hemet, Calif. 92344

Continuation-in-part of Ser. No. 649,512, Sep. 11, 1984, Pat. No. 4,638,672. This application Aug. 18, 1986, Ser. No. 897,260

Int. Cl.[4] B01F *5/04*

U.S. Cl. 366—174 **12 Claims**



1. A fluid mixing device comprising:

(a) a conduit having a central axis and a uniform internal configuration for conveying a first fluid therethrough in a predetermined direction;

(b) a fluid dispersing member of smaller size than said conduit and having a passage therein for discharging a second fluid into said first fluid;

(c) said fluid dispersing member consisting essentially of two frustums joined at their larger ends and mounted coaxially within said conduit substantially normal to the direction of fluid flow through said conduit and with their peripheries spaced symmetrically inwardly from said conduit;

(d) the sloped wall of the joined frustums facing in the downstream direction extending inwardly to adjacent the axis of said conduit at an angle in the order of about 22° to the plane defined by the periphery of the joined ends of said frustums, and terminating in a flat face parallel to said plane;

(e) said joined frustums causing the fluid flowing thereabout through said conduit to generate a violent turbulence immediately downstream of the sloped wall of the frustum facing in the downstream direction, and effecting controlled turbulence downstream of said dispersing member, thereby to provide intimate and homogeneous mixing of the fluids.

4,812,050

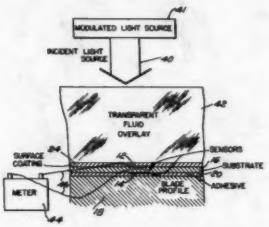
METHOD FOR CALIBRATING A HEAT FLUX GAUGE

Alan H. Epstein, Lexington; Gerald R. Guenette, Salem, both of Mass., and Robert J. G. Norton, Kennesaw, Ga., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 738,217, May 28, 1985, Pat. No. 4,722,609. This application Oct. 19, 1987, Ser. No. 111,846

Int. Cl.[4] G01D *18/00*; **G01K** *15/00*

U.S. Cl. 374—1 **21 Claims**



1. A method for providing heat flux gauge measurements for use in calibrating said heat flux gauge comprising the steps of:

insuring that the surface of said, heat flux gauge has an emissivity greater than 0.1 over the wavelength band of a light source to be used in calibration;

covering the surface of said heat flux gauge with a first fluid of known thermal properties;

applying a light source of known modulation to an area encompassing said heat flux gauge;

measuring a temporal electrical output of a sensor of said gauge;

covering the surface of said heat flux gauge with a second fluid that replaces said first fluid, said second fluid being of known thermal properties;

applying said light source to an area encompassing said heat flux gauge; and

measuring the temporal electrical output of said sensor of said gauge.

4,812,051

APPARATUS FOR INVESTIGATING THERMAL TRANSFORMATIONS

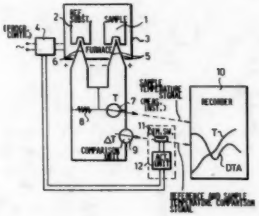
Jenö Paulik; Ferenc Paulik, and Miklós Arnold, all of Budapest, Hungary, assignors to Magyar Optikai Muvek, Hungary

Filed Apr. 30, 1986, Ser. No. 857,716

Claims priority, application Hungary, May 10, 1985, 1766/85

Int. Cl.[4] G01N *25/00*; **G01K** *1/14*

U.S. Cl. 374—10 **6 Claims**



1. A temperature controlling system for investigating thermal transformations comprising:

a furnace, operated by a program-controller, wherein the temperature in the furnace changes with a predetermined speed;

a sample container and a reference substance container disposed in the furnace for receiving a sample and a reference substance, respectively, each container having similar thermal parameters;

respective temperature sensing elements coupled to the sample container and the reference substance container for sensing the temperature of the sample and the reference substance;

a temperature comparing unit connected to the sample and reference temperature sensing elements for forming a difference output signal of the temperatures, the difference output signal being an input to a recorder;

a differentiating network means receiving as an input the difference output temperature signal for providing an output which is the derivative of the difference output temperature signal;

limit switch means for limiting the value of the derivative output and thereby providing a quasi-static temperature signal; and

an actuating unit having the quasi-static temperature signal as an input, the actuating unit being connected to the program-controller whereby the furnace temperature is controlled in accordance with the quasi-static temperature signal.

4,812,052

APPARATUS FOR CREEP ENDURANCE TESTING STRUCTURAL COMPONENTS

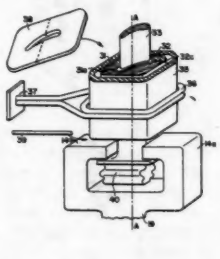
Peter Adam, Dachau; Thomas Sedlmair, Biberbach, and Manfred Podleech, Hebertshausen, all of Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 9, 1987, Ser. No. 94,828

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1986, 3631153

Int. Cl.[4] G01N *3/18*

U.S. Cl. 374—50 **8 Claims**



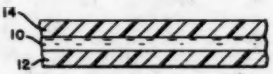
1. An apparatus for creep testing a structural component, especially a component having a complicated configuration, comprising a mold type member made of a highly heat resistant metal for forming a heat susceptor, said mold type member having an inner surface so dimensioned that a gap is formed between said inner surface of said mold type member and the surface of said structural component when said structural component is placed in said mold type member conforming substantially to at least a portion of said configuration for enclosing said structural component during testing, means for permitting removal of said structural component from said mold type member, and induction heating coil means surrounding said mold type member for heating said structural component through said mold type member, said apparatus further comprising clamping means arranged for holding a portion of said structural component protruding from said mold type member, and means for applying tension stress to said structural component through said clamping.

4,812,053

ACTIVATABLE TIME-TEMPERATURE INDICATOR

Himangshu R. Bhattacharjee, Randolph, N.J., assignor to Life-Lines Technology, Inc., Morris Plains, N.J.

Continuation of Ser. No. 815,696, Jan. 2, 1986, abandoned. This application Aug. 7, 1987, Ser. No. 83,752
Int. Cl.[4] G01K 3/04
U.S. Cl. 374—102 20 Claims



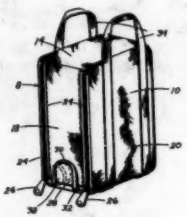
1. An activatable time-temperature indicator comprising:
(a) a substrate on which is a coating of an oxygen-senitive reaction product of a triarylmethane dye and a decolorant for the dye and
(b) a removable oxygen barrier over the coating.

4,812,054

INSULATED BEVERAGE BOX CARRIER

Vern S. Kirkendall, 783 Portal Dr., Chico, Calif. 95926

Filed Aug. 5, 1988, Ser. No. 228,945
Int. Cl.[4] B65D 30/08, 81/38
U.S. Cl. 383—110 3 Claims



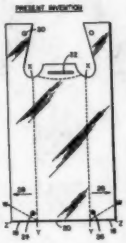
1. A thermal insulated beverage box carrier, comprising:
a. a housing; said housing being a substantially rectangular six sided hollow structure sized and arranged for receiving and removably encasing a beverage box with a spigot; said housing an assemblage of panels with said panels each substantially rectangular and fabricated with two layers of a first pliable material encasing at least one layer of flexible thermal insulation; said assemblage of panels including two vertical side panels, one horizontal top panel, one horizontal base panel, one vertical back panel, and one openable front panel; said side panels, said back panel, said top panel, and said base panel seamed edgewardly in permanent attachment one to the other with said openable front panel permanently attached to said top panel upwardly, said openable front panel affixed edgewardly with parallel vertical zippers removably attaching said front panel to two frontwardly exposed edges of said side panels, there being an inverted U-shaped passage opened downwardly centrally in said openable front panel for said spigot, said passage rimmed with reinforcing material, there being removable attachment means for affixing the free ends of said openable front panel adjacent said U-shaped passage to an exposed frontwardly edge of said base panel;
b. carrying handle means attached to said carrier.

4,812,055

THERMOPLASTIC BAG AND METHOD OF FORMING THE SAME

Randolph D. Prader, Fairport, and Gordon L. Benoit, Victor, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 29, 1987, Ser. No. 139,215
Int. Cl.[4] B65D 33/02
U.S. Cl. 383—119 4 Claims



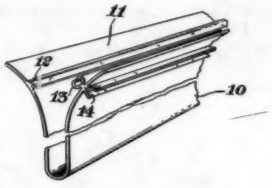
1. A Thermoplastic film bag structure comprising front and rear outer walls connected by gusseted side walls and having an open mouth top portion with double film handles at opposite end regions of said mouth; said bag in its lay-flat condition having a bottom formed by a transverse seal extending across four film layers in the gusset regions and across two film layers in the region between gussets; said bag having area seals, each located a spaced distance from said transverse seal and a spaced distance from the innermost gusset folds on each side of said bag, said area seals being seals between the outer walls and the gusset walls, said area seals being located so as to relieve stress on expansion of said gussets at the seal region points where said transverse seal extends from the two-film seal to the four film seal.

4,812,056

RECLOSABLE, FLEXIBLE CONTAINER HAVING AN EXTERNALLY OPERATED FASTENER

Larry M. Zieke, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 25, 1985, Ser. No. 715,562
Int. Cl.[4] B65D 33/16
U.S. Cl. 383—65 7 Claims



1. A reclosable, flexible container comprising:
(1) a pair of opposing facing generally parallel supporting walls joined at their edges to form a pouch-like structure having at least one pair of unjoined edges thereby defining an opening to the interior of the pouch-like structure;
(2) a first mating closure element on the inner surface of one of the walls forming a part of the wall and projecting therefrom;
(3) a second mating closure element on the inner surface of the other wall forming a part of the wall and projecting therefrom, said second mating closure element facing said first mating closure element and being located so as to

releasably, interlockingly receive the first mating closure element thereby joining the heretofore unjoined edges of the pouch-like structure; and

(4) disengaging means for at least partially disengaging the second mating closure element from an interlocking relationship with the first mating closure element, said disengaging means comprising a means for increasing the width of the second mating closure element, said disengaging means being located on the outer surface of the supporting wall on which the second mating closure element is located, said disengaging means forming a part of the wall and projecting therefrom.

4,812,057

GUIDANCE SYSTEMS ON MACHINES

Siegfried Kuhn, Dürnau, and Peter-Jürgen Kreher, Göppingen, both of Fed. Rep. of Germany, assignors to Boehringer Werkzeugmaschinen GmbH, Göppingen, Fed. Rep. of Germany

PCT No. PCT/EP86/00259, § 371 Date Jan. 5, 1987, § 102(e) Date Jan. 5, 1987, PCT Pub. No. WO86/06666, PCT Pub. Date Nov. 20, 1986

PCT Filed May 2, 1986, Ser. No. 5,036

Claims priority, application Fed. Rep. of Germany, May 6, 1985, 3516238

Int. Cl.[4] F16C *29/02*

U.S. Cl. 384—42 **1 Claim**

1. A guidance system on a machine tool comprising:

a twist-resistant, vibration damping support body of concrete, and at least one body forming guidance ways, said at least one body being cemented onto or cast into said support body, being non-twist-resistant, and consisting of ceramic material, the support body having a grain size differing from that of the ceramic material less than steel or gray cast iron, whereby a substantially better bond between said at least one body and said support body is achieved than with steel or gray cast iron.

4,812,058

CAGE FOR TAPERED ROLLER BEARINGS

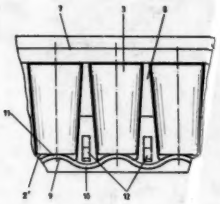
Heinrich Hofmann, Schweinfurt, and Manfred Tröster, Bad Kissingen, both of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer (KGaA), Fed. Rep. of Germany

Filed Jun. 22, 1988, Ser. No. 209,991

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1987, 3723168

Int. Cl.[4] F16C *33/46*

U.S. Cl. 384—563 **2 Claims**



1. A tapered roller bearing comprising an outer ring with an annular inwardly facing outer raceway, an inner ring inside the outer ring with an annular, outwardly facing inner raceway, the inner ring raceway having axially inwardly facing opposite, spaced apart flanges;

a row of tapered bearing rollers disposed between the inner raceway and the outer raceway for rolling thereover and disposed in the space in the inner ring between the flanges;

a cage comprising a radially smaller annular ring disposed at the radially smaller side of the row of rollers, a radially larger annular ring disposed at the radially larger side of the row of rollers, a plurality of webs disposed at intervals around the rings of the cage for joining the cage rings, and a respective web being disposed between neighboring rollers in the row of rollers for separating the rollers;

one of the side rings of the cage being undulating in shape annularly around the ring with successive undulations undulating axially inwardly toward the rollers and axially outwardly from the rollers, the undulations on the one ring being placed for defining axially inwardly projecting crests on the undulations and the crests are each being respectively located at a respective axial end of one of the rollers, and the one side ring being shaped and placed for the undulation crests to apply force against the rollers and being slightly prestressed for urging the rollers toward the other side ring and toward the inner ring flange at the side of the rollers away from the one ring;

each of the webs having a generally radially inwardly directed projection which also extends axially outward and engages the one inner ring flange at the one side ring of the cage, the projections having axial end surfaces which engage the one flange; the crests on the undulations have tips which engage the adjacent ends of the rollers;

the distance between the plane which passes through the axial end surfaces of the radial projections from the webs and the plane defined by the tips of the undulation crests is slightly greater than the difference between the distance apart of the flanges of the inner ring and the length of the rollers disposed between the flanges.

4,812,059

PRINTER APPARATUS WITH AUTOMATIC GAP ADJUSTING MECHANISM

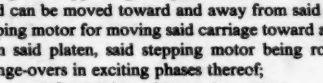
Hideo Masaki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 27, 1987, Ser. No. 112,879

Claims priority, application Japan, Oct. 31, 1986, 61-259732

Int. Cl.[4] B41J *11/20*

U.S. Cl. 400—56 **7 Claims**



1. A printer apparatus comprising:

a platen around which at least one sheet of paper is wrapped;

a print head for printing on said at least one sheet of paper wrapped around said platen;

a carriage for supporting said print head such that said print head can be moved toward and away from said platen;

a stepping motor for moving said carriage toward and away from said platen, said stepping motor being rotated by change-overs in exciting phases thereof;

driver means for driving said stepping motor;

pulse generating means for generating first pulses having a first pulse period of a first constant value and second pulses having a second pulse period of a second constant value which is larger than said first pulse period; and

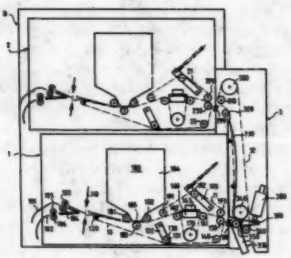
driver control means, responsive to said pulse generating means, for controlling said driver means such that when said first pulses are output by said pulse generating means, said driver means drives said stepping motor with a first torque when moving said print head toward said platen, and when said second pulses are output by said pulse generating means, said driver means drives said stepping motor with a second torque, greater than said first torque, when moving said print head away from said platen.

4,812,060

APPARATUS FOR PROCESSING CARD TICKETS, IN PARTICULAR TRAVEL TICKETS INCLUDING A MAGNETIC TRACK

Alain L. Pailler, Verrieres Le Buisson, France, assignor to Electronique Serge Dassault, Saint Cloud, France

Filed Jul. 24, 1987, Ser. No. 77,691
Claims priority, application France, Jul. 30, 1986, 8611058
Int. Cl.[4] B41J 3/54
U.S. Cl. 400—82 **14 Claims**



1. Apparatus for processing card tickets, the apparatus including a pair of similar printing and/or encoding modules each having at least one station for printing on a ticket or for encoding a ticket, together with means for driving a ticket along a path internal to the module in order to pass it through said station and then to a ticket outlet defined between two wheels, the apparatus further including:

coupling means provided between the respective outlets from the two modules and an outlet receptacle in order to take tickets from one or the other or both of the modules and to stack the tickets in the receptacle;

each module having a separate inlet with means for inserting tickets into the respective module inlets from separate supply reels;

two modules being disposed substantially in parallel with each other,

a guide member extending between the outlets of the two modules wherein the coupling means including a taut belt running in a closed circuit over wheels and pressing against said guide member over its path between the outlets of the two modules, and

the belt of the coupling means facing the outlets from the modules and extending substantially perpendicularly to the assembly of the two modules.

4,812,061

TECHNIQUE FOR IMPROVING THE WEAR RESISTANCE OF A WIRE MATRIX PRINTING HEAD

Shinzi Tsuyuki, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1987, Ser. No. 88,057
Claims priority, application Japan, Aug. 28, 1986, 61-202433
Int. Cl.[4] B41J 3/12
U.S. Cl. 400—124 **11 Claims**

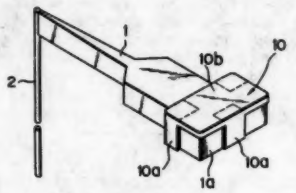
1. A printing head comprising:

a plurality of printing wires each having a base end;

a plurality of armatures equal in number to the plurality of printing wires, each of said plurality of armatures having a tip and a rotatably supported portion, the plurality of armatures having the tip of each connected, respectively, to the plurality of printing wires at the base end thereof;

armature supporting means for rotatably supporting the rotatably supported portion of each of the plurality of armatures so that the tip of each of the plurality of armatures is movable in the longitudinal direction of the printing wires;

reciprocal drive means for driving the plurality of armatures to reciprocate the plurality of printing wires between a



projected position and a drawn position in the longitudinal direction of the plurality of printing wires; and

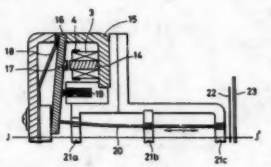
a plurality of wear resistant chips detachably mounted, respectively, on the rotatably supported portion of the plurality of armatures.

4,812,062

PRINT HAMMER WITH FLUX DETECTION FOR PRINT PRESSURE CONTROL

Hiroyuki Ishinaga, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1987, Ser. No. 127,173
Claims priority, application Japan, Dec. 12, 1986, 61-294735
Int. Cl.[4] B41J 9/38
U.S. Cl. 400—157.2 **7 Claims**



1. A recording apparatus of impact type with print pressure control, said recording apparatus comprising:

a recording element supported so as to be reciprocatively movable relative to the recording medium;

electromagnetic force generating means for generating a magnetic force which makes said recording element project toward and impact against said recording medium in response to an applied energizing signal of a predetermined polarity;

detection means for detecting the magnetic flux existing at said electromagnetic force generating means; and

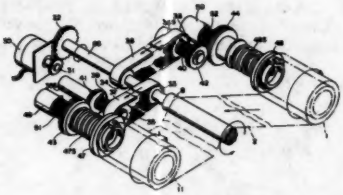
control means for controlling, in response to outputs from said detection means, said energizing signal and for reversing the polarity thereof when a detected output from said detection means reaches a predetermined value, so as to excite a magnetic field in a direction to erase the residual magnetic flux.

4,812,063

BIDIRECTIONAL INK SHEET DRIVING MECHANISM IN A THERMAL TRANSFER PRINTER

Michio Kunimitsu, Yawata, and Hiroshi Tomita, Kyoto, both of Japan, assignors to Sanyo Electric Ltd., Osaka, Japan

Continuation of Ser. No. 897,193, Aug. 15, 1986, abandoned.
This application Mar. 16, 1988, Ser. No. 169,076
Claims priority, application Japan, Aug. 20, 1985, 60-182403
Int. Cl.[4] B41J *33/16*
U.S. Cl. 400—234 6 Claims



1. A thermal transfer multi-color line printer wherein recording paper is imprinted from an ink sheet having a plurality of color frames, the recording paper is overlapped on one color frame of the ink sheet, carried forward with the ink sheet for initial setting and printed by a thermal head while being carried forward, and the recording paper is carried in a reverse direction after said printing from said color frame and overlapped on another color frame of the ink sheet for a next printing, comprising

a supply roll for an ink sheet around which an unsued portion of said ink sheet is wound;

a take up roll for winding a used portion of said ink sheet therearound;

a carrier roller positioned between both rolls for carrying the ink sheet in both the forward and the reverse direction;

a motor for applying a rotational driving force to the carrier roller;

a first holding reel for holding said take up roll which is rotationally driven;

a first shaft located between said carrier roller and said take up roll;

a first rotating member and a second rotating member supported by said first shaft and provided with a one-way clutch therebetween, and the first rotating member being driven by the rotation of said carrier roller and the one-way clutch transmitting the rotational driving power to the second rotating members when the ink sheet is carried in the forward direction;

a third rotating member being driven by the second rotating member, being fitted to a second shaft which supports said holding reel for said take up roll with a one-way clutch on said second shaft that prohibits the rotation of said first holding reel when the ink sheet is carried in the reverse direction;

a first friction member, which is fitted to the second shaft and disposed between said first holding reel for said take up roll and the third rotating member, for transmitting the rotational driving force of said first friction member from the third rotating member to said first holding reel for said take up roll by a frictional force thereof when the ink sheet is carried in the forward direction and applying a brake power to first said holding reel for said take up roll by a frictional force thereof so as to apply a back tension to the ink sheet when the ink sheet is carried in the reverse direction and rotationally drives the take up roll;

a second holding reel for holding said supply roll which is rotationally driven;

a third shaft located between said carrier roller and said supply roll;

a fourth rotating member and a fifth rotating member supported by said third shaft and provided with a one-way clutch therebetween, and the fourth rotating member being driven by the rotation of said carrier roller and the one-way clutch transmitting the rotational driving power to the fifth rotating member when the ink sheet is carried in the reverse direction;

a sixth rotating member being driven by the fifth rotating member, being fitted to a fourth shaft which supports said second holding reel for said supply roll with a one-way clutch on said fourth shaft that prohibits the rotation of said second holding reel when the ink sheet is carried in the forward direction; and

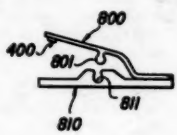
a second friction member, which is fitted to the fourth shaft and disposed between said second holding reel for said supply roll and the sixth rotating member, for transmitting the rotational driving force of said second friction member from the sixth rotating member to said second holding reel for said supply roll by a frictional force, when the ink sheet is carried in the reverse direction and applying a brake power to said holding second reel for said supply roll by a frictional force thereof so as to apply a back tension to the ink sheet when the ink sheet is carried in the forward direction to rotationally drive the supply roll.

4,812,064

SHEET SECURING MECHANISM

Atsushi Hatakeyama; Masaki Izumi, and Seishi Ohmori, all of Tokyo, Japan, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 28, 1987, Ser. No. 138,623
Claims priority, application Japan, Feb. 24, 1987, 62-40619
Int. Cl.[4] B41J *13/22*
U.S. Cl. 400—622 1 Claim



1. In a sheet securing mechanism having a pair of upper and lower clamping members for securing a sheet and with one of said clamping member being adapted to be moved from an open state to a closed sheet securing state, the improvement comprising:

a. spaced sheet retaining pins provided on the clamping surface of at least one of said clamping members so that when said members are in said closed state such pins are pressed into a sheet;

b. magnetic actuating means including a magnetic actuator selectively excitable in first and second conditions, in said first condition causing said members to be in said open state and in said second condition causing said members to be in said closed state; and

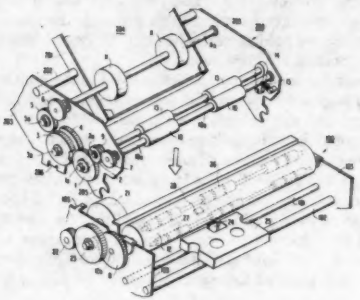
c. alignment means for maintaining the same relative position of said upper and lower members each time after the movable clamping member is moved to said closed state including a non-sheeting engaging projection provided on one of said member and said other member defining a recess for receiving said projection when in said closed state.

4,812,065

CUT SHEET FEEDING MECHANISM

Jun Shimogawara, Tokyo, and Hironori Nakamura, Kawasaki, both of Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Mar. 16, 1987, Ser. No. 26,335
Claims priority, application Japan, Mar. 14, 1986, 61-56443
Int. Cl.[4] B41J *13/10*
U.S. Cl. 400—624 3 Claims



1. A cut sheet feeding mechanism for feeding a cut sheet from a sheet hopper (201) to a platen roller (12) provided on a platen roller shaft (12*a*) connected to a drive motor (21), said platen roller being rotated by said drive motor in a forward rotary direction to further feed said cut sheet to a printing position of a printer, said cut sheet feeding mechanism comprising:

a pick-up roller shaft (11*a*);

a pick-up roller (11), provided on said pick-up roller shaft, which rotates in said forward rotary direction to pick up said cut sheet from stacked cut sheets in said sheet hopper;

a platen gear (8) connected to said platen roller shaft;

an idler gear shaft (1*a*);

a first idler gear (1) provided on said idler gear shaft and engaged with said platen gear;

a first notched gear (3) including a first gear portion and a first notched portion, said first notched gear being engaged with said first idler gear (1) at said first gear portion and being disengaged with said first idler gear at said first notched portion;

a planet gear (2) rotatably supported by an arm (9) such that said planet gear is engaged with said first idler gear, said arm being rotatably supported by said idler gear shaft; and

a pick-up roller gear (6) connected to said pick-up roller shaft (11*a*), said pick-up roller gear being associated with said first notched gear (3);

said drive motor (21) driving said platen gear (8) to rotate in a reverse rotary direction, opposite said forward rotary direction, when said first notched portion of said first notched gear is opposed to said first idler gear so as to rotate said arm around said idler gear shaft to engage said planet gear with said first gear portion of said first notched gear, so that said first notched gear is rotated in said forward rotary direction by said platen gear through said first idler gear and said planet gear, whereby said first gear portion of said first notched gear is engaged with said first idler gear,

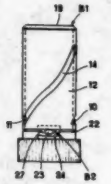
said drive motor subsequently driving said platen gear to rotate in said forward rotary direction so as to rotate said arm around said idler gear shaft to separate said planet gear from said first idler gear so that said first notched gear is further rotated in said forward rotary direction by said platen gear through said first idler gear, whereby said pick-up roller gear is rotated in said forward rotary direction by said first notched gear until said first notched portion of said first notched gear is opposed to said first idler gear, a rotary force of said platen roller in said forward direction being transmitted to said pick-up roller in a manner such that said pick-up roller also rotates in said forward direction until said pick-up roller has fed said cut sheet from said sheet hopper by a predetermined length.

4,812,066

DEVICE FOR APPLYING A PASTY PRODUCT, IN PARTICULAR A COSMETIC PRODUCT SUCH AS LIPSTICK AND A TUBULAR ELEMENT FOR SUCH A DEVICE

Jean Louis H. Gueret, Paris, France, assignor to L'Oreal, Paris, France

Continuation of Ser. No. 874,169, May 20, 1986, abandoned.
This application Jun. 27, 1988, Ser. No. 220,942
Claims priority, application France, Dec. 18, 1984, 84 19335
Int. Cl.[4] A45D *40/06*
U.S. Cl. 401—78 15 Claims



1. A device for applying a pasty product, in particular a cosmetic product such as lipstick, presented in stick form, comprising: a tubular element with a slide wherein there is slidably mounted a cup intended to accommodate the stick of the product and comprising at least one stub of said cup engaged in the slide; a cylindrical shell having a wall having at least one helical groove, said shell being fitted on the tubular element and being retained on the latter by stop means at its two axial ends, the stub of the cup being engaged in the helical groove of the shell and an external, metallic casing, wherein the shell is secured whilst the tubular element can turn in relation to the said shell and casing, the device being such that when the tubular element is caused to turn in relation to the shell, the cooperation of the stub of the cup with the groove produces an axial movement of the cup and the movement of the stick of the product according to the direction of rotation via an outlet opening of the tubular element, wherein the tubular element with the slide has an external wall which is provided towards the end remote from the outlet opening with elastic stop means capable of bearing on the adjoining edge of the cylindrical shell when the latter has been fitted on the tubular element, and another stop means at the end adjacent said outlet opening, the said elastic stop means remote from said outlet opening pushing the said shell continuously along the direction parallel to the axial direction against the said another stop means provided at the end adjacent said outlet opening, said elastic stop means comprising a boss projecting radially towards the outside, said tubular element having a flexible strip and said boss engaging said flexible strip of said tubular element, said flexible strip being oriented transversely in relation to the axis of said tubular element, said flexible strip being defined by two transverse holds formed in said tubular element on either side of said flexible strip.

4,812,067

DISPOSABLE APPLICATOR PACKAGE

James B. Brown, 690 Bedford Rd., Armonk, N.Y. 10504, and Jack W. Kaufman, 357 Frankel Blvd., Merrick, N.Y. 11566

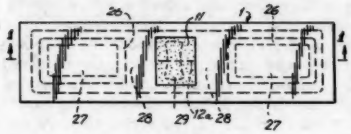
Filed Nov. 13, 1987, Ser. No. 120,345
Int. Cl.[4] B65D *35/00;* A47L *13/17*
U.S. Cl. 401—132 25 Claims

1. An applicator package for the application of flowable materials to surfaces, comprising:

(a) an applicator pad;

(b) a backing member, one surface of which is in adhesive contact with said pad, comprising a first, flexible sheet;

(c) a second member, in contact with the other surface of said backing member, comprising a formed semi-rigid sheet having at least one recess adjacent said pad; at least one cavity, or reservoir for flowable materials distally spaced from said recess; a peripheral groove in said second member whereby a tubular space is formed between said backing in fluid connection with said recess and spaced from the distal and side edges of said member and surrounding said cavity on its distal end and sides; coplanar separations, between said cavity and said groove and



between said cavity and recess, in contact with said backing member, said backing member being sealed to said second member at the periphery thereof and at the separations between the cavity, groove and recess whereby pressure on the cavity portion of the second member causes at least one of said coplanar separations to separate from the backing member thereby allowing fluid to pass into the groove and then into said recess or, directly into the recess; and

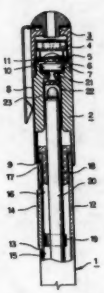
(d) a slit or weakened portion adjacent to said pad and between said pad and said recess to permit the flow of said flexible materials therethrough into said pad and therethrough to the desired surfaces.

4,812,068

WRITING DEVICE WITH ALARM

Jae Pil Seong, 733-1271, Dongcheon-dong, Kyeongju-shi, Kyeongsangbuk-do, Rep. of Korea

Filed Jul. 15, 1988, Ser. No. 219,674
Int. Cl.[4] B43K *29/00*
U.S. Cl. 401—195 **1 Claim**



1. A writing device having an alarm comprising:

a cap and cap portion assembly sequentially containing in connected state a buzzer, a chip-bonding board, a mercury cell, a conductive spring, a holder, and a connecting tube; a connecting piece installed in such a manner that its total length is extended along the total length of the cap portion, its front hook being positioned at the front end of the cap portion, and its ring portion being positioned in contact with the metal terminal of the chip-bonding board; and a main body of the said device provided with a elongated slot and a connection slot and accommodating a switch piece, a switch lever an elongated metal tube and a socket, which are arranged in such a manner that the upper end of the switch piece aligned with the connection slot is secured by means of the socket, and is connected to the hook of the conductive connector, and the ring at the lower end of the switch piece is positioned around the elongated metal tube in a state elastically urged upward, this rising switch piece being restricted by the switch lever which is installed within the elongated slot.

4,812,069

WRITING IMPLEMENT HAVING BUILT-IN PAPER DISPENSER

Kevin R. White, 1941 "C" Ave., NE., Cedar Rapids, Iowa 52402, and Danny R. Gilmore, 440 Humboldt, Denver, Colo. 80218

Filed Mar. 11, 1987, Ser. No. 24,596
Int. Cl.[4] B43K *29/12*
U.S. Cl. 401—195 **19 Claims**

11. A cartridge for dispensing a writing material from a writing implement, comprising:

a generally cylindrical casing including a pair of generally circular end walls and a side wall uniting said end walls, said side wall having a circumferentially directed clip arm disposed thereon;

a roll of writing material retained within said casing by said clip arm;

means for rotatably disposing said roll of writing material between said end walls of said casing;

a radially extending guide projection disposed on said casing having a curved wall disposed to curl a free end of said writing material roll in a direction opposite a winding direction of said writing material roll;

a roller mechanism rotatably mounted in close proximity to said curved wall of said guiding projection for friction feeding a free end of said roll between said roller mechanism and said curved wall of said guiding projection; and

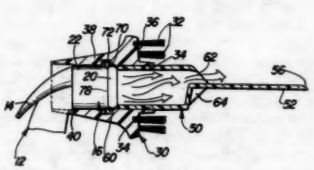
means for effecting selective rotation of said roller mechanism to feed said free end of said writing material roll from said cartridge.

4,812,070

BRUSH AND SCRAPER ATTACHMENT FOR FAUCET SPRAY HANDLE

Garry R. Marty, Noblesville, Ind., assignor to Masco Corporation of Indiana, Indianapolis, Ind.

Filed May 21, 1987, Ser. No. 52,447
Int. Cl.[4] A46B *11/00, 11/02, 11/06*
U.S. Cl. 401—289 **16 Claims**



1. An improved cleaning attachment having a fluid passageway, said cleaning attachment detachably mountable to a hand-held auxiliary fluid spray device associated with a faucet and having a discharged nozzle, the improvement comprising:

a seal ring seated within said fluid passageway of said cleaning attachment, said seal ring including an outer shoulder adapted to lockingly seat within an annular groove formed in said fluid passageway of said cleaning attachment, an inner annular lip adapted to lockingly engage the discharge nozzle of the spray device, and a sleeve flap portion extending from said outer shoulder and inner lip, said sleeve flap portion extending between said fluid passageway and said discharge nozzle to prevent fluid flow past said seal ring, said cleaning attachment being detachable secured to the discharge nozzle of the spray device.

4,812,071

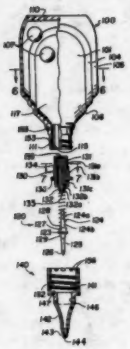
CORRECTION FLUID PEN

Pran Batra, deceased, late of Clarks Summit, and by Shanta Batra, legal representative, 502 Fawnwood Dr., Clarks Summit, both of Pa. 18411

Continuation-in-part of Ser. No. 900,841, Aug. 27, 1986, abandoned. This application Jan. 7, 1988, Ser. No. 142,086

Int. Cl.[4] B43K *1/06, 8/00*

U.S. Cl. 401—264 **13 Claims**



1. A correction fluid pen for applying a correction fluid of the type which includes an opaque covering pigment and a volatile solvent, the correction fluid pen comprising:

a barrel having a substantially rectangular cross section and a fluid chamber with an open end for retaining a reservoir of fluid, the barrel, including opposite substantially flat side walls, opposite substantially flat end walls connected between said side walls, a shoulder closing one end of said barrel and a bottom wall closing an opposite end of said barrel, and a bellows structure bounding at least a major portion of each side wall, said barrel being made of plastic material and said side walls and bellows structure being manually squeezable inwardly into said fluid chamber, said barrel including a neck extending from said shoulder and having a bore therethrough communicating with said fluid chamber;

a chlorinated-based solvent correction fluid contained in said fluid chamber;

an applicator assembly connected to said neck and including a cavity extending therethrough, said applicator assembly including a funnel shaped portion, said cavity including a conical passage extending through said funnel shaped portion and terminating at a discharge opening at an end of said funnel-shaped portion;

an orifice assembly seated between said neck and said applicator assembly in said bore of said neck and in said cavity of said applicator assembly, said orifice assembly, including a passage therethrough, communicating said fluid chamber with said conical passage;

a solid, elongated stylus, slidably mounted in said applicator assembly, said stylus having a top engagable into said discharge opening for closing said discharge opening and being retractable into said conical passage to define an annular space between said tip and said discharge opening for the discharge of correction fluid through said annular space, said stylus including a cylindrical portion connected to said tip and defining an annular passage with said funnel-shaped portion of said applicator assembly in said conical passage;

spring means engaged with said stylus for urging said stylus into engagement with the applicator assembly to close said discharge opening against a discharge of fluid; and

a boss extending from said orifice assembly toward said discharge opening, said spring means comprising a spring having one end engaged around at least a portion of said boss, said boss having an orifice therethrough communicating with said passage in said orifice assembly, said stylus having a conical portion with a small diameter end connected to said cylindrical portion of said stylus, and a large diameter end, at least one spring stop projection on said conical portion of said stylus adjacent said large diameter end thereof, said spring having an opposite end engaged around said large diameter end of the conical portion of said stylus, said stylus including a cylindrical stem extending from said large diameter end of said conical portion of said stylus, at least a portion of said stem extending into said orifice for metering a flow of correction fluid through said orifice.

4,812,072

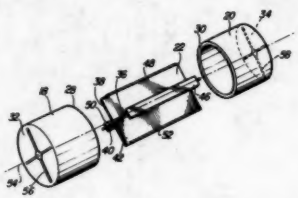
TORSION STRUCTURAL PIVOT

John J. Brooks, Santa Ynez, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Mar. 11, 1988, Ser. No. 166,854

Int. Cl.[4] F16D *1/00*

U.S. Cl. 403—24 **9 Claims**



1. A structural pivot that substantially eliminates the geometric center shift of its rotating members, said pivot comprising:

a first end cap having an outer face extending transversely to the major axis of the cap;

an elastic element having at least three equally spaced blades meeting at a central axis and radially extending therefrom, the lateral ends of each blade including a transversely extending flange, said flanges being spaced from inner walls of the end caps; and

mounting means for connecting opposite longitudinal edges of the blades to the end caps so that the central axis is collinear with the major axis of the end caps.

4,812,073

METHOD AND APPARATUS FOR FASTENING A SEALING BELLOWS

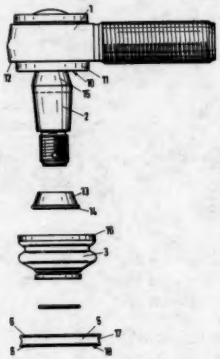
Willy Blumberg, Meerbusch; Hans J. Schütt, Aachen; Ulrich Mette, Essen; Karl H. Barbet, Korschenbroich; Fritz Busse, Hilden, and Benno Klier, Meerbusch, all of Fed. Rep. of Germany, assignors to TRW Ehrenreich GmbH & Co KG, Dusseldorf, Fed. Rep. of Germany

Filed Dec. 1, 1987, Ser. No. 127,507

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1986, 3641030

Int. Cl.[4] F16C *11/00*; **F16D** *1/02*

U.S. Cl. 403—134 **8 Claims**



1. Fastening of a sealing bellows (3) to a joint housing (1) of a ball joint, especially a ball joint for use in motor vehicles wherein the sealing bellows (3) has a housing end bellows rim (16) that engages an approximately cylindrical bellows seat (11) formed on the outer rim of a housing opening (10), and is biased against the bellows seat (11) by a retaining ring (5) made of a sheet metal, surrounding the housing end bellows rim (16), and having a zone of a smallest diameter defined by a circumferential concave recess (17) curved radially inward, characterized in that the curving of the concave recess (17) of the retaining ring (5), before the fastening of the sealing bellows(3) is effected only to an extent such that the retaining ring (5) can be slipped over the housing end bellows rim (16), and that the retaining ring (5) for fastening of the sealing bellows (3) is axially compressed to reduce its inner diameter in the axial zone of the concave recess whereby the ring sealingly biases the housing end bellows rim (16) against its bellows seat (11).

4,812,074

APPARATUS FOR MAKING BAG MATERIAL

Steven Ausnit, New York, N.Y., and Robert S. Nocek, Stamford, Conn., assignors to Minigrip, Inc., Orangeburg, N.Y.

Division of Ser. No. 770,886, Aug. 30, 1985, abandoned. This application Jun. 15, 1987, Ser. No. 62,391

Int. Cl.[4] B31B *1/84*

U.S. Cl. 493—213 **5 Claims**

1. Apparatus for making bag material, comprising:

means for supporting a sheet of bag wall material;

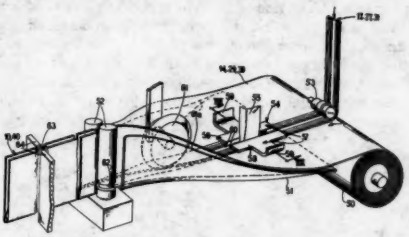
means for supplying a zipper strip with a web and spaced complementary separably interlockable profiles along opposite margins of said strip;

means for engaging said profiles and guiding said strip into assembly with said sheet;

means for securing said web to said sheet but leaving at least one of said margins free and unattached relative to said sheet so that the sheet can swing away from said one margin;

rotary means for creasing said web along a line between said profiles;

means following said means for creasing for folding said



sheet and said web along said crease and effecting nesting of said strip within the fold thus produced;

and means for cross sealing the folded web and zipper strip into bag sections.

4,812,075

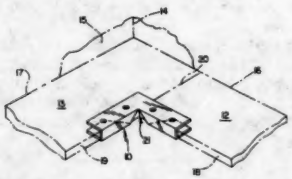
INSIDE CORNER BRACKET

Lavin, Sr. Gerald P., 5210 Salinas Valley Dr., Apt. F, St Louis, Mo. 63128

Filed Dec. 4, 1986, Ser. No. 937,833

Int. Cl.[4] F16B *12/00*

U.S. Cl. 403—403 **11 Claims**



1. A corner bracket for connecting angularly-related structural pieces at an inside corner of less than 160° formed therebetween, said bracket comprising first and second channel members, each of which has spaced top and bottom wall portions interconnected only by an edge wall portion, said top, edge and bottom wall portions of each channel member being serially connected at substantially right angles, said edge and bottom wall portions of the first channel member being separated from the edge and bottom wall portions of said second channel member and only said top wall portions of said first and second channel members being integrally connected together at a predetermined angle to position the edge wall portions of said first and second channel members in intersecting planes forming an inside angle of less than 160° substantially corresponding to that of the inside corner of the structural pieces, and said top and bottom wall portions of each said channel member being in substantially parallel spaced relation and extending from said edge wall portion thereof in a direction outwardly away from the intersecting planes of said inside angle to form angularly related and outwardly opening channels for receiving such structural pieces at the inside corner thereof.

4,812,076

ASPHALT HOPPER HEATING SYSTEM

Robert M. Yant, P.O. Box 28434, Sacramento, Calif. 95828

Filed Aug. 11, 1986, Ser. No. 895,118

Int. Cl.[4] E01C *19/00, 23/14*

U.S. Cl. 404—108 **8 Claims**

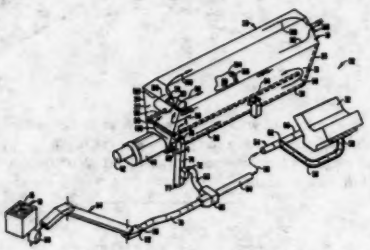
1. An asphalt hopper heating system, for use with a pave-

ment patching vehicle used to patch pavement, the vehicle of the type having a supply hopper holding a supply of pavement patching material, the supply hopper mounted to the vehicle for movement between raised and lowered positions, the vehicle including an engine of the type producing a flow of heated exhaust gas from an exhaust port, the system comprising:

the supply hopper having a wall;

the supply hopper including heating conduit means for creating a fluid path in thermal contact with the wall;

a conduit pivotally mounted to the vehicle and to the supply hopper, the conduit and the heating conduit means having



complementary mating elements defining openings into the conduit and the heating conduit means, the complementary mating elements forming a substantially sealed joint to fluidly couple the conduit and the heating conduit means only when the supply hopper is in the raised position; and

an engine exhaust conduit connecting the conduit and the exhaust port so to permit passage of exhaust gas from the exhaust port, through the exhaust conduit, through the conduit, and through the heating conduit means of the supply hopper when the supply hopper is in the raised position.

4,812,077

PNEUMATIC/HYDRAULIC WAVE GENERATOR

George W. Raike, Ashland, Ohio, assignor to The Great Wave Company, Inc., Overland Park, Kans.

Filed Dec. 17, 1987, Ser. No. 134,091

Int. Cl.[4] E04H *3/18*; E03B *3/00*

U.S. Cl. 405—79 **21 Claims**

1. A pneumatic/hydraulic wave generator, which comprises:

(a) a hydraulic system including first and second caissons each having:

(1) an upper end;

(2) a lower end; and

(3) an open passage at said lower end; and

(b) a pneumatic system including:

(1) blower means;

(2) a manifold communicating with said blower means;

(3) a first duct line communicating with said first caisson;

(4) a second duct line communicating with said second caisson;

(5) an air directional valve assembly having a first position communicating said manifold with said first duct line and a second position communicating said manifold with said second duct line;

(6) said air directional valve assembly including actuating means adapted for moving said air directional valve assembly between its first and second positions; and

(7) a relief valve assembly selectively communicating one of said caissons with the atmosphere.

4,812,078

MECHANIZED UNIT FOR DIGGING A TRENCH AND LAYING ELONGATE OBJECTS

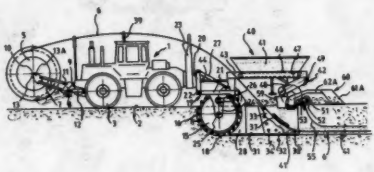
Daniel Rivard, Daumeray, France, assignor to ETS. Rivard S.A., Daumeray, France

Filed Jun. 19, 1987, Ser. No. 63,966

Claims priority, application France, Jun. 26, 1986, 86 09277

Int. Cl.[4] F16L *1/02*; H02G *9/00*

U.S. Cl. 405—179 **12 Claims**



1. A mechanized unit for digging a trench in the ground and laying elongate continuous object, like tubes, cables or similar in said trench, comprising:

a motor driven vehicle;

a digging wheel connected to said vehicle;

a reserve containing said elongate continuous object and connected to said vehicle;

a receptacle containing a fine powdery material, which is sand, and mounted on a trailer hitched to said motor-driven vehicle, said trailer being disposed substantially parallel to said digging wheel; and

means for feeding said fine powdery material from said receptacle on the trailer to said guide device so that, during formation of said trench by the digging wheel, said powdery material flows below said elongate continuous object in the bottom of the trench, and for then covering said elongate continuous object, this latter thus being buried in said fine powdery material deposited in said trench.

4,812,079

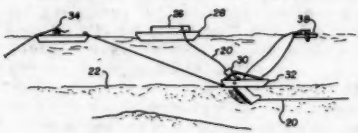
EMBEDDING CABLELIKE MEMBERS

Harry Johnson, and Ralph M. Ware, both of Merritt Island, Fla., assignors to Casper Colosimo & Son, Inc., Pittsburgh, Pa.

Filed Aug. 29, 1986, Ser. No. 902,146

Int. Cl.[4] F16L *1/04*; E02F *5/10*

U.S. Cl. 405—164 **33 Claims**



1. Apparatus for embedding a cable-like member under the bed of a body of water, comprising an underwater cable embeddor comprising the following inventive improvements:

a rapidly loaded or unloaded adjustable-depth soil-embedment depressor assembly comprising:

a low pressure jet assembly attached as the water bed soil cutting blade of said adjustable-depth soil-embedment depressor assembly connected to a source of fluid under

pressure for creating a jet flow at a flow rate sufficiently high and a pressure sufficiently low to temporarily liquefy water bed soils in the path of said cable-like member without substantial permanent soil displacement or turbidity,

a rock-cutting assembly attachable to said soil embedment depressor assembly and having teeth and connected to a source of fluid water under pressure providing hydraulic power to a hydraulic motor which drives said teeth of said rock-cutting device to provide an incision in relatively soft rock for the safe embedment of said member in the incision,

a rock-embedment depressor assembly selectively attachable to said soil embedment depressor assembly and including a hydraulically driven rotary tungsten-carbide tipped saw blade assembly attachable as the water bed rock-cutting extension of said adjustable-depth soil-embedment depressor assembly, said rock-embedment depressor assembly adapted to cut into rock relatively harder than said soft rock of said incision and connected to a source of fluid under pressure providing a hydraulic cushion under said rock-embedment depressor assembly and providing a hydraulic stream to constantly clear rock debris from the incision in the water bed rock for the full and safe embedment of said cable-like member in the rock incision, and

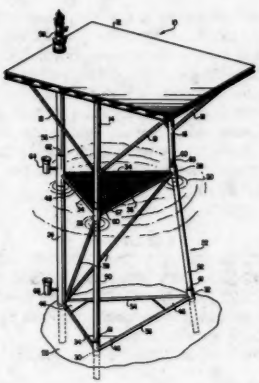
a remote-reading sensor to report and record the depth of embedment within the water bed soils and/or rock.

4,812,080

OFFSHORE PLATFORM JACKET AND METHOD OF INSTALLATION

Richard G. Urquhart, Dallas, and Adel S. Tawfik, Houston, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif. and Brown & Root, Inc., Houston, Tex.

Filed Jul. 24, 1987, Ser. No. 77,481
Int. Cl.[4] E02B *17/00*
U.S. Cl. 405—227 **11 Claims**



1. A support jacket for supporting a deck of an offshore platform and the like above the surface of a body of water, said jacket comprising:

a single substantially vertically extending hollow column member extending above said surface for receiving means forming a first elongated pile extending through said column member;

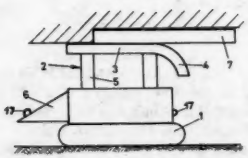
a plurality of vertically and laterally spaced guide sleeves connected to said column member only by at least one of diagonal and generally horizontal extending brace means, said guide sleeves being arranged to receive and guide respective second and third elongated piles and for laterally bracing said second and third piles for supporting said deck above said jacket, said guide sleeves including a first pair of laterally spaced part guide sleeves disposed generally adjacent one end of said column member and a second pair of said guide sleeves laterally spaced apart and adjacent the other end of said column member, each pair of said guide sleeves being interconnected to said column member by said brace means, said guide sleeves extending generally vertically only a short distance from points of connection with said brace means to minimize the weight of said jacket and reduce fores imposed on said jacket due to wave action, and selected ones of said guide sleeves being adapted to be secured to said second and third piles, respectively.

4,812,081

MOVABLE CONSOLIDATING TRESTLE FOR SECURING THE EXCAVATING EDGE

Ernst Urschitz, Amstetten, Austria, assignor to Voest-Alpine Aktiengesellschaft, Muldenstrasse, Austria

Filed Jun. 30, 1987, Ser. No. 69,605
Claims priority, application Austria, Jul. 2, 1986, 1791/86
Int. Cl.[4] E21D *15/44*
U.S. Cl. 405—296 **9 Claims**



1. A movable consolidating trestle for securing fracture edges in a mine roof comprising: an endless-tread drive and a rigid frame carried by said drive; a roof-supporting planar cap located above said frame, said cap having a longitudinal dimension, a forward end portion and a rear end portion; at least four vertically extendable and retractable props having lower ends carried by said frame and having upper ends supporting said cap, said props being arranged under said forward and rear end portions of said cap such that said rear end portion can be lowered relative to said forward end portion whereupon said cap becomes inclined upwardly and forwardly relative to said frame, whereby in a lowered position of said rear end portion, in the event that the trestle becomes buried in fallen mine-roof material, the vertically downward force of the material on said cap results in a horizontal component of force on said cap in the forward direction, said forward end portion of said cap including a front section which has an upper surface extending downwardly and forwardly relative to the plane of said cap, the relationship of said downwardly and forwardly extending section to the plane of said cap being such that, when said rear end portion of said cap has been lowered, said upper surface of said front extension extends downwardly and forwardly relative to the vertical downward force of mine-roof material when the trestle is buried in such material.

4,812,082

UNDERGROUND SURGE IRRIGATION SYSTEM

Robert L. Cooper, Rt. 2, Box 132, Ulysses, Kans. 67880

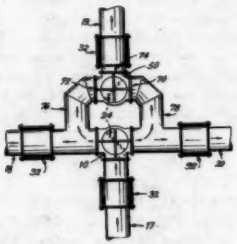
Filed Mar. 24, 1987, Ser. No. 29,617
Int. Cl.[4] E02B *11/00*; F16K *11/07*
U.S. Cl. 405—36 **12 Claims**

1. A surge irrigation system for use in fields containing underground water supply pipes comprising:

a primary valve located underground on the underground water supply line;

said valve having at least two selectable outlet positions to direct the flow through the valve alternatively through the selectable outlets;

means to connect the primary valve outlets to separate underground pipes leading from said valve in different directions;



control means accessible to the surface for selectively switching said valve between its outlet positions according to a predetermined time schedule;

means connecting each separate pipe to the surface of a field for surge irrigation.

4,812,083

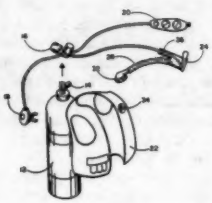
QUICK-DISCONNECT APPARATUS FOR INFLATING A SCUBA DIVING BUOYANCY JACKET

Arthur R. Mosier, Los Almitos, Calif., assignor to Undersea Industries, Inc., Rancho Dominguez, Calif.

Filed Jun. 1, 1987, Ser. No. 55,998

Int. Cl.[4] B63C *11/08*

U.S. Cl. 405—186 **17 Claims**



1. A quick-disconnect apparatus for selectively connecting and disconnecting an inflator hose and a scuba diver's buoyancy jacket; the apparatus comprising:

an annular receptacle position on said buoyancy jacket and having a tubular extension providing an air flow channel into the interior of said jacket;

a hose connecting member being connected at a first end to said inflator hose and having at a second end, means for grasping said receptacle in rotatable engagement therewith while providing a leak-proof air flow path between said inflator hose and said channel; and

means for releasing said grasping means without applying any forces in the direction of said tubular extension.

4,812,084

TUBBING RING FOR LINING A TUNNEL

Harald Wagner, Kirchenberg, and Alfred Schulter, Linz, both of Austria, assignors to Ingenieure Mayreder, Kraus & Co. Baugesellschaft M.b.H., Austria

Filed Dec. 17, 1987, Ser. No. 133,998

Claims priority, application Austria, Dec. 23, 1986, 3416/86

Int. Cl.[4] E21D *11/04*

U.S. Cl. 405—153 **7 Claims**

1. A tubbing ring for lining a tunnel with a succession of said rings, the tubbing ring having two end faces lying in respective planes and a longitudinally extending axis intersecting the planes of the end faces, the tubbing ring comprising:

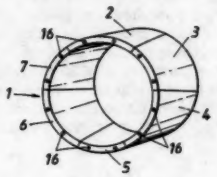
(a) an even number of adjoining blocks,

(1) each block having two substantially planar longitudinal side faces whose planes are inclined with respect to a line parallel to the ring axis whereby each block has a trapezoidal configuration and the side faces having center lines extending in a radial direction with respect to the ring and two longitudinal edges extending parallel to the center line, and each longitudinal side face abutting a corresponding side face of an adjoining block in the ring,

(2) two opposite substantially planar end faces respectively extending in the planes of the tubbing ring end faces,

(3) at least one coupling recess in each planar end face, and

(4) a longitudinally extending groove in each planar longitudinal side face extending in a central portion thereof intermediate the opposite end faces and parallel to the longitudinal edges, the grooves in the abutting side faces being complementary and in registry with each other,



(b) a coupling element received in each recess for coupling succeeding ones of the tubbing rings in the tunnel lining, and

(c) a plastic spline inserted in the complementary grooves in the abutting side faces whereby the adjoining blocks are connected by tongue-and-groove joints, the splines being adapted for slidingly guiding the abutting side faces for sliding each block until the end faces thereof are flush with the end faces of the adjoining blocks and the coupling elements being adapted for sliding into a corresponding one of the coupling recesses in a respective planar end face of a block in a preceding one of the rings in the tunnel lining.

4,812,085

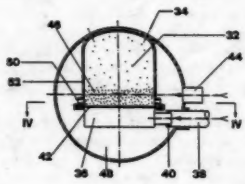
CONDUIT FOR TRANSPORTING FINELY-DIVIDED OR FINE-GRANULAR, DRY BULK MATERIALS AND A PROCESS FOR OPERATION OF SAME

Walter Merz, Küsnacht, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Dec. 30, 1985, Ser. No. 815,019

Int. Cl.[4] B65G *53/18*

U.S. Cl. 406—88 **23 Claims**



1. Conduit for transporting finely-divided or fine-granular,

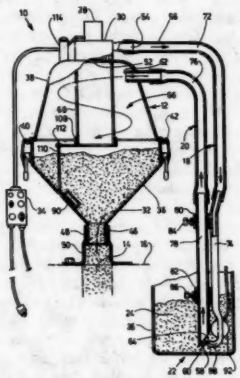
dry bulk materials which comprises an approximately horizontally running conduit including a material conveyance zone comprising at least one closed feeder channel, a zone for introducing a fluidizing medium into said material conveyance zone to fluidize said materials comprising a closed fluidizing channel, a material which is permeable to gas and fluids separating said introducing zone and material conveyance zone comprising a fluidizing base between said feeder channel and fluidizing channel, impeller nozzles with at least one outlet for a gaseous or fluid impeller medium for feeding said impeller medium into said feeder channel at a higher pressure than said fluidizing medium for transporting said fluidized materials, and means for introducing a fluidizing medium into said feeder channel to fluidize said materials and substantially simultaneously feed impeller medium into said feeder channel via said impeller nozzles at a higher pressure than said fluidized materials for transporting finely-divided or fine-granular, dry bulk materials.

4,812,086

PARTICULATE MATERIAL LOADER

Jaroslav Kopernicky, Bramalea, Canada, assignor to Stream Industrial Systems Inc., Mississauga, Canada

Filed May 8, 1986, Ser. No. 860,837
Claims priority, application Canada, May 8, 1985, 481,036
Int. Cl.[4] B65G *53/14*
U.S. Cl. 406—153 **4 Claims**



1. A particulate plastic loader comprising:

a reservoir having a material outlet in a lower portion thereof;

an air supply conduit having an inlet end and having an outlet end portion external to the reservoir;

an air return conduit having an inlet end portion external to the reservoir and having an outlet end communicating with the interior of the reservoir, the inlet end portion having an inlet end surface which has a general plane forming an acute angle relative to the general axis of the inlet end portion;

air flow generating meansfor forcing air from the interior of the reservoir into the inlet end of the supply conduit, the air flow generating means having an air inlet communicating with the interior of the reservoir and an air outlet communicating with the inlet end of the supply conduit;

the interior of the reservoir having an air flow diffusing region between the outlet end of the return conduit and the air inlet of the air flow generating means; and,

junction means for joining the outlet end portion of the supply conduit and the inlet end portion of the return conduit to form a junction at which the outlet end portion of the supply conduit and the inlet end portion of the return conduit are maintained in generally parallel side-by-side relationship, a gap is maintained between the inlet end surface of the return conduit and the outlet end portion of the supply conduit, and the inlet end surface of the return conduit faces towards the outlet end portion of the supply conduit;

the outlet end portion of the supply conduit being terminated with an air flow deflecting structure that deflects air flows from the outlet end portion of the supply conduit across the gap directly towards the inlet end surface and into the inlet end portion of the return conduit;

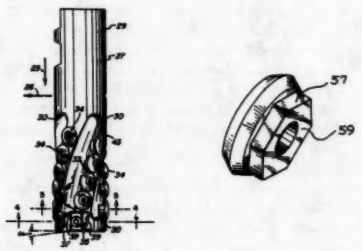
the outlet end portion of the supply conduit and the air flow guiding structure extending no more than a predetermined distance below the inlet end surface of the return conduit when the junction is embedded in a generally vertical orientation in a mass of particulate plastic such that air flows in the gap draw sufficient particulate plastic from below the inlet end portion of the return conduit and the outlet end portion of the supply conduit that the junction lowers itself continuously into the mass of particulate plastic as particulates are entrained to the reservoir.

4,812,087

END MILL CUTTING TOOL AND INDEXABLE INSERT THEREFOR

Daniel R. Stashko, Holly, Mich., assignor to GTE Valenite Corporation, Troy, Mich.

Filed Jul. 9, 1987, Ser. No. 71,440
The portion of the term of this patent subsequent to Jul. 21, 2004, has been disclaimed.
Int. Cl.[4] B23C *5/02*
U.S. Cl. 407—42 **8 Claims**



1. A helical end mill cutter, comprising a rotary body having an outer periphery, and slots formed in said outer periphery alternately extending fully to the distal end of said body, each of said slots having pocket portions for receiving in staggered sequence therealong a curved rhomboidal rotatable on-edge cutting insert positioned to said fully extending slots distal end,

said pocket comprises a seating face for said insert, a threaded aperture centrally disposed on said seating face, a support surface intersecting said seating face and having at least a pair of flat face surfaces with each member's surface parallel to the other for supporting abutment of said inserts.

said curved rhomboidal insert having alternately opposed substantially planar and curved cutting edges disposed about a center,

said cutting edges formed from opposed frusto-conical surfaces,

said cutting edges characterized by radii of curvature displaced from said center, colinear therewith substantially along an insert diagonal,

said insert further positioned on said body in having a portion of one of said curved cutting edges being disposed in said fully extending slot, with a cutting edge corner extending below the bottom plane of said cutter body, and

said curved rhomboidal insert further disposed at a positive

axial rake and positive radial rake on said cutter body such that said radial rake proceeds from neutral to positive along said cutting edge upon entering a workpiece,

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4,812,088

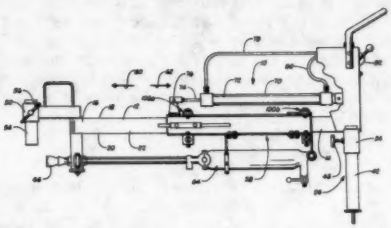
DOWELING TOOL

Leon M. Hake, Perry, Okla., assignor to Wittwer Construction Co., Inc., Stillwater, Okla.

Filed Jan. 23, 1987, Ser. No. 6,726

Int. Cl.[4] B23B *45/04*

U.S. Cl. 408—130 **10 Claims**



1. A doweling tool for drilling a dowel hole in concrete to facilitate the insertion of dowels in such dowel hole comprising:

a guide bar having a first end, a second end, an upper surface, a lower surface, a first side and a second side;

a support frame connected to the guide bar for supporting the guide bar in an operating position;

a carriage movingly connected to the guide bar for movement in a forward direction generally from the first end toward the second end of the guide bar and for movement in a reverse direction generally from the second end toward the first end of the guide bar, the carriage comprising:

a carriage frame; and

roller means connected to the carriage frame and having a portion rollingly engaging the guide bar as the carriage is moved in the forward and reverse directions for rollingly supporting the carriage frame on the guide bar;

a pneumatically operated drilling tool being connected to the carriage and having a drill bit and being adapted to receive operating air, the drilling tool drivingly rotating the drill bit in an operating condition when receiving operating air for drilling the dowel hole in the concrete;

a pneumatic cylinder having a cylinder base and a cylinder rod extending a distance from the cylinder base, the pneumatic cylinder being adapted to receive operating air and having a forward condition for receiving operating air and moving the cylinder rod in the forward direction generally outwardly from the cylinder base and having a reverse condition for receiving operating air and moving the cylinder rod in the reverse direction generally into the cylinder base, a portion of the pneumatic cylinder being connected to the support frame and another portion of the pneumatic cylinder being connected to the carriage, the pneumatic cylinder moving the carriage and the drilling tool connected thereto in the forward direction when the pneumatic cylinder is conditioned in the forward condition for drillingly forming the dowel hole in the concrete in the operating condition of the drilling tool and the pneumatic cylinder moving the carriage and the drilling tool connected thereto in the reverse direction when the pneumatic cylinder is conditioned in the reverse condition for pulling the drill bit out of the dowel hole.

4,812,089

TOOLHOLDERS FOR MACHINE TOOLS

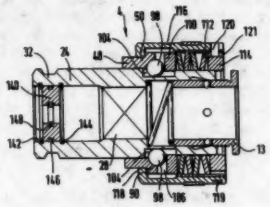
Laurence R. Petrie, "Hollins", Hebden Bridge, West Yorkshire, HX7 7DZ, England

Filed Sep. 18, 1985, Ser. No. 777,296

Claims priority, application United Kingdom, Sep. 29, 1984, 8424674

Int. Cl.[4] B23B *31/02*

U.S. Cl. 408—139 **1 Claim**



1. A toolholder for use in a machine tool, having a torque-limiting clutch comprising: coaxial rotary driving and driven members, a first ball socket formed in said driving member and opening into an axially facing surface of said driving member; a second ball socket in said driven member; a ball located in both said first and second sockets for transmitting rotary driving force from said driving member to said driven member; a pressure member applying an axial resilient load to said ball to retain said ball in the ball socket in the driving member, but permitting disengagement of said ball from said socket in said driving member when a predetermined torque is exceeded; said socket in said driving member comprising a deep portion which is adapted to embrace at least 90° of the periphery of said ball in the axial plane, and a shallow portion breaking into said deep portion and adapted to embrace less than 90° of the periphery of said ball in the axial plane, said shallow portion being on one side of said deep portion, so that in the forward direction of rotation, said ball occupies the shallow portion of the socket and in the reverse direction of rotation, said ball occupies the deep portion of the socket; and a deflecting device engagement with said ball when said ball becomes disengaged from said first ball socket, and arranged to produce motion of said ball to a position where it does not encounter said first socket from which it has disengaged, during continued rotation of said driving member after such disengagement.

4,812,090

METHOD OF AND APPARATUS FOR ADJUSTING THE WEIGHT OF A WORKPIECE

Nobuo Kimura, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Jan. 27, 1987, Ser. No. 7,197

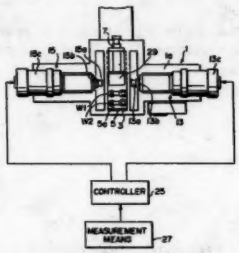
Claims priority, application Japan, Jan. 28, 1986, 61-17577; Mar. 17, 1986, 61-59044

Int. Cl.[4] B23C *3/00*

U.S. Cl. 409—132 **18 Claims**

1. A method of adjusting the weight of a workpiece to a predetermined value by machining a weight-adjustment portion formed on the workpiece comprising the steps of positioning a feeding means for a cutting tool to a predetermined reference feeding position and driving the cutting tool carried on said feeding means to machine said weight-adjustment portion, weighing the workpiece after the machining, obtaining an adjusted feeding position in response to the measured weight of the workpiece, said adjusted feeding position being a distance from said reference feeding position; and then positioning said feeding means to the adjusted feeding position and driving the cutting tool, which is carried on said feeding means and has been used for said machining, to machine said weight-adjustment portion again.

5. An apparatus for adjusting the weight of a workpiece by machining a weight-adjustment portion formed on the workpiece comprising cutting tool means for machining the weight-adjustment portion, work supporting means capable of supporting both a first workpiece whose weight-adjustment portion has been subjected to a first machining and a second workpiece the weight-adjustment portion thereof not having been machined, means for positioning the cutting tool means to an adjusted feeding position for a second machining of the first workpiece and to a reference feeding position for a first machining of the second workpiece, means for feeding the cutting



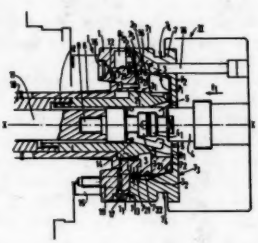
tool means positioned at the reference and the adjusted feeding positions with respect to the workpieces in the direction from the first workpiece to the second one, drive means for the cutting tool means which drives the cutting tool means to carry out the first and second machinings of the weight-adjustment portions of the first and the second workpieces, means for determining said adjusted feeding position in response to the weight of the first workpiece, and means for controlling said positioning means, feeding means and drive means to carry out the second machining of the first workpiece and the first machining of the second workpiece in this order.

4,812,091

EXCHANGE SYSTEM ON AN IRREMOVABLE MACHINING CENTER

Jacques Barbieux, Louvres, France, assignor to Sandvik Tobler S.A., Louvres, France

Filed Feb. 19, 1987, Ser. No. 16,367
Claims priority, application France, Mar. 6, 1986, 86 03131
Int. Cl.[4] B23B *31/26*
U.S. Cl. 409—233 **15 Claims**



1. An exchange mechanism for an irremovable machining center for securing thereto removable members such as clamping and holding devices, said mechanism comprising:

a cassette connectible to a front end of a removable member, said cassette including a first face inclined obliquely relative to a longitudinal axis of said machining center,

said machining center and cassette respectively including first and second positioning surfaces extending in generally front-to-rear directions and disposed in axially overlapped relationship when said cassette is secured on said machining center, with a radial clearance disposed between said first and second surfaces to enable said cassette to be adjusted radially when mounted on said machining center,

at least one locking member carried by said machining center and including a second face oriented at an inclination substantially corresponding to that of said first face, said locking member being displaceable from an unlocking position to a locking position wherein said first and second inclined faces contact one another in a manner exerting a force on said cassette having an axial component urging said cassette toward said machining center and a radial component tending to radially adjust said cassette for centering said cassette relative to said axis, and

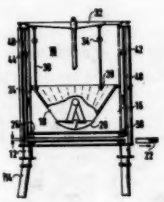
actuating means carried by said machining center for displacing said locking member from said unlocking position to said locking position to secure said cassette to said machining center.

4,812,092

FEED HOPPER FOR A LOADING INSTALLATION OF A SHAFT FURNACE

Emile Lonardi, L-Bascharage, Luxembourg, assignor to Paul Wurth S.A., Luxembourg

Filed Mar. 16, 1988, Ser. No. 168,900
Claims priority, application Luxembourg, Mar. 24, 1987, 86819
Int. Cl.[4] F23K *3/06*
U.S. Cl. 414—199 **4 Claims**



1. Feed hopper for the loading installation of a shaft furnace comprising:

a cylindrical side wall having a vertical axis and being supported by an annular rolling ring wherein said side wall is rotatable about said vertical axis, said side wall having a lower inner edge;

a funnel shaped bottom having a central outflow orifice controlled by a valve;

said bottom being separated from said side wall and resting freely on said inner edge of said side wall;

raising means for raising said bottom within said side wall; and

lifting means for lifting said side wall slightly from said rolling ring.

4,812,093

STAKE POCKET TIE-DOWN ANCHOR

Henry E. Millar, Jr., 36717 Government Rd., Dorena, Oreg. 97434

Filed Sep. 27, 1988, Ser. No. 249,700
Int. Cl.[4] B61D *45/00*
U.S. Cl. 410—110 **3 Claims**

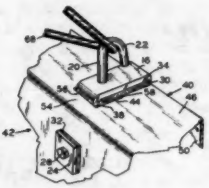
1. A tie-down anchor, for use in combination with a stake pocket having an opening formed in the top of the side rail of a pickup truck bed or the like, said stake pocket having an inner pocket side wall on the inside of the bed, which inner

pocket side wall has a hole formed therein, wherein the tie-down anchor comprises:

a. an L-shaped member having a first leg and a second leg; the first leg, having a threaded hole formed therein, which extends vertically into the stake pocket so that it lies adjacent to said inner pocket side wall of said stake pocket; and

the second leg which extends outwardly and horizontally beyond the stake pocket opening and atop the side rail;

b. a tie-down connection member attached to the second and horizontal leg and extending upwardly so as to be available for a tie-down line;



c. a clamping plate, having a hole formed therein; and

d. a threaded bolt which sequentially penetrates the clamping plate and the inner pocket side wall of the stake pocket, and engages with the threaded hole of the first and vertical leg;

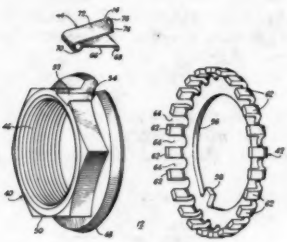
e. so that upon tightening said bolt, the first and vertical leg is drawn toward the pocket side wall of the stake pocket, thereby rigidly securing the tie-down anchor within the stake pocket by forcing the second and horizontal leg tight against the top of the side rail, or by clamping the inner pocket side wall of the stake pocket between the first and vertical leg and the clamping plate.

4,812,094

LOCKING FASTENER ASSEMBLY FOR THREADED JOINT

William L. Grube, Lake Bluff, Ill., assignor to MacLean-Fogg Company, Mundelein, Ill.

Filed Sep. 24, 1987, Ser. No. 100,746
Int. Cl.[4] F16B *39/02*
U.S. Cl. 411—134 **14 Claims**



1. A threaded joint of the type tightened or loosened with a tool and comprising in combination:

a relatively fixed structure including a threaded member extending along an axis and including first restraining means;

a relatively movable locking fastener assembly engageable with said relatively fixed structure and including a rotatable fastener and a retainer;

said fastener having a tool receiving portion, a flange, and a thread structure engageable with said threaded member for tightening or loosening of the joint in response to rotation of the fastener around the axis;

said retainer including means for holding said retainer in assembly with said flange, and including second restraining means engageable with said first restraining means for preventing rotation of said retainer relative to said threaded member; and

latch means connected between said fastener and said retainer for permitting relative rotation between said fastener and retainer in released position and preventing relative rotation between said first and retainer in a latched position;

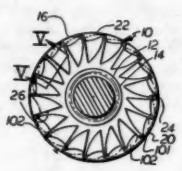
said latch means including latch release means disposed at said tool receiving portion of said fastener for releasing said latch means in response to engagement of said fastener by said tool.

4,812,095

THREADED FASTENER

Frank Piacenti, and Pat Ferrante, both of Campbellsville, Ky., assignors to Emhart Industries, Inc., Farmington, Conn.

Continuation-in-part of Ser. No. 18,263, Feb. 24, 1987, abandoned. This application Mar. 18, 1988, Ser. No. 169,658
Int. Cl.[4] F16B *39/282*
U.S. Cl. 411—188 **7 Claims**



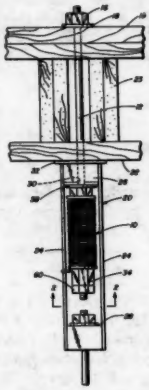
1. A threaded fastener comprising an elongated shank on which a helical thread form is disposed, a workpiece entering portion of said shank disposed at one end thereof and a tool accommodating head disposed at the opposite end of said shank, and having a concave thread facing surface extending radially outwardly from the centerline of said shank beyond said helical thread form, a plurality of ribs disposed on said thread facing surface of said fastener and spaced circumferentially about the centerline of said shank under said head and positioned to contact a workpiece through which said workpiece entering portion of said shank is inserted upon rotation of said helical threads in said workpiece, each of said ribs comprising a brake surface extending radially outwardly from a point adjacent to the intersection of the outer periphery of said shank and said thread facing surface and having an outer edge for contacting said workpiece and an inner edge spaced from said outer edge in a direction away from said workpiece and a ramp surface sloping from said brake surface outer edge away from said workpiece, each of said ribs culminating in a tooth-like projection located at the outer periphery of said thread facing surface and each tooth-like projection comprising a brake surface and a ramp surface facing said centerline which ramp surface of said tooth-like projection has the shape of a quartered portion of an ellipsoid; whereby rotation of said fastener in one direction causes said ramp surfaces to slide along said workpiece and rotation of said fastener in the opposite direction causes said brake surfaces to penetrate said workpiece producing a braking action.

4,812,096

SELF-TIGHTENING NUT

Peter O. Peterson, 28 Woodside Way, Ross, Calif. 94957

Filed Dec. 11, 1987, Ser. No. 131,577
Int. Cl.[4] F16B *39/12*; E04C *3/10*
U.S. Cl. 411—231 5 Claims



1. A self-tightening fastening device adapted to be mounted on a threaded end of a body which is anchored at its other end, said threaded end extending through a surrounding bearing surface, said device comprising:

a first rotatable means threawded to said body and adapted to bear against said surrounding surface;

a second rotatable means threaded to said body and spaced from said first rotatable means therein , said first and second rotatable means each comprising a nut with internal threads fixed to a washer means;

a coiled spring having a plurality of coils, the opposite end portions of said spring being connected to said washer means of each said rotatable means;

and stop means for preventing the rotation of said rotatable means in one direction, said stop means comprising a link of stiff wire having one end connected to the washer means of said second rotatable means having a bent portion at its other end adapted to engage a structural member adjacent to said device;

whereby torsional force applied directly to said second rotatable means is stored as potential energy in said storage means and transmitted as take-up torque to said first rotatable wherever it tends to loosen on said threaded body.

4,812,097

SPRING ACTION FASTENER

Anthony D. Moulton, 305 Melbourne, Columbia, Mo. 65201

Filed Jul. 18, 1984, Ser. No. 632,050
Int. Cl.[4] F16B *21/00*
U.S. Cl. 411—347 5 Claims

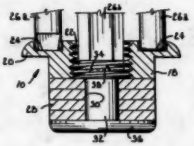
1. A fastener for installation in an aperture formed in a pair of parts to be fastened, said fastener comprising:

a tubular body having an axially extending, threaded passageway;

a head of greater diameter than the body secured to one end of the latter;

an elongated stud projecting into the body from the end of the latter opposite said head, said stud including an externally threaded shank engaged in said passage for relative telescoping of the stud with respect to the body responsive to rotation of the shank relative to the body; and

an elongated, resilient spring element wound into a cylindrically shaped helical spring telescoped over the stud exteriorally of the body and having a normal configuration of greater diameter than said body, one end of the element being secured to the body and the other end of the element being secured to the shank whereby rotation of the shank relative to the body in one direction winds the spring to a deformed condition of reduced diameter, the spring element having the inherent restorative capability to exert a



biasing force for returning the spring to its normal configuration and rotating the shank in the opposite direction relative to the body,

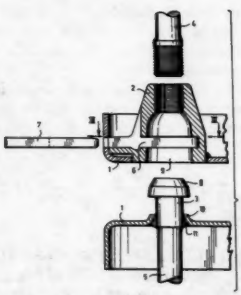
the respective threads in the passage and on the shank being configured to cause relative telescoping of the stud into the body responsive to the rotation of the shank in said opposite direction relative to the body.

4,812,098

DEVICE FOR JOINING TOGETHER BUILDING UNITS

Matti O. Kaimo, Virkkala, Finland, assignor to Oy Lohja Ab, Nummela, Finland

Filed Oct. 22, 1987, Ser. No. 111,273
Claims priority, application Finland, Oct. 27, 1986, 864338
Int. Cl.[4] F16B *19/00*; F16C *11/06*
U.S. Cl. 411—360 2 Claims



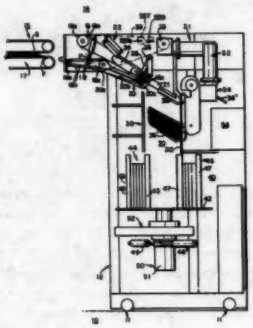
1. A device for joining together building units, comprising a lock housing positioned in a first building unit; a metal plate positioned in a second building unit and provided with a hole; a peg having a free end arranged to be inserted through the hole and attached to the edge of the hole, the peg being arranged to be inserted into the lock housing in the joined position of the units and being provided with a flange at the free end thereof; and a locking means arranged to be inserted into the lock housing for locking the peg in the housing in the direction of the longitudinal axis thereof, the edge of the hole provided in the metal plate of the second unit forming a collar which projects from the plate in the direction of the free end of the peg.

4,812,099

SIGNATURE STACKER

Christer A. Sjogren, Miami, and Carl D'Amico, Ft. Lauderdale, both of Fla., assignors to Quipp Incorporated, Miami, Fla.

Division of Ser. No. 707,494, Mar. 1, 1985, Pat. No. 4,678,387.
This application May 5, 1987, Ser. No. 47,008
Int. Cl.[4] B65H *31/30*
U.S. Cl. 414—788.2 **34 Claims**



15. A turntable assembly for forming signature stackers comprising:

a support frame;

a first support housing mounted on said support frame;

a platform;

a platform support extending into said support housing;

means in said first support housing for rotatably supporting said platform support in said first support housing;

motor drive means joined to said platform support and having a drive shaft extending through said platform support;

a pair of movable wall assemblies arranged in spaced parallel fashion upon the platform and including closed loop movable wall means for engaging and supporting a stack of signatures;

means arranged along the underside of said platform coupled between said drive shaft and said movable wall assemblies for coupling drive from said drive shaft to said movable wall assemblies;

each of said movable wall assemblies including at least one gate/pusher means for pushing articles deposited in the region between said movable wall assemblies off of said platform.

4,812,100

ROLLING TRACK FOR A ROTARY HOPPER

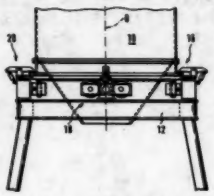
Emile Lonardi, L-Bascharage, and Pierre Mailliet, L-Howard, both of Luxembourg, assignors to Paul Wurth S.A., Luxembourg

Filed Mar. 16, 1988, Ser. No. 168,901
Claims priority, application Luxembourg, Mar. 24, 1987, 86824
Int. Cl.[4] F23K *3/06*
U.S. Cl. 414—199 **10 Claims**

1. Circular rolling track for a rotary hopper for a loading installation of a shaft furnace, the rotary hopper including a circular pedestal, comprising:

a plurality of rollers supported by a fixed reinforcement, the circular pedestal of the hopper traveling on said rollers, said pedestal including a toothed ring for rotary movement about its vertical axis;

said rollers being grouped in pairs wherein each pair of rollers is carried by a support axle pivotable about a radial axis, said support axle being supported by said fixed reinforcement; and



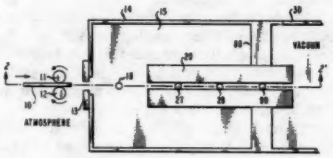
each of said pairs of rollers being mounted on their respective support axles by floating bearing means mounted on first spring means.

4,812,101

METHOD AND APPARATUS FOR CONTINUOUS THROUGHPUT IN A VACUUM ENVIRONMENT

Carroll H. George, Norwood, N.Y.; Guy W. Lynott, Succasunna, and Andrew N. Pargellis, Hoboken, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 27, 1987, Ser. No. 42,507
Int. Cl.[4] B65G *65/00*
U.S. Cl. 414—220 **11 Claims**



1. A method of moving a workpiece having two major surfaces between the atmosphere and a vacuum chamber comprising the steps of: passing the workpiece between a pair of compliant members mounted in cavities having walls defined by an enclosure located between the atmosphere and the vacuum such that the members form a rotating seal with at least one of their respective cavity walls and the workpiece as it passes therethrough; creating volumes of differential pressure between the compliant members and the vacuum; and passing the workpiece between a series of flexible members located between one of said volumes of differential pressure and the vacuum chamber, said flexible members forming seals with the major surfaces of the workpiece.

4,812,102

STORAGE AND RETRIEVAL MACHINE FOR TOTE PANS

Harry E. Smith, Concord, Ohio, and William E. Riedner, Battle Creek, Mich., assignors to Jervis B. Webb Company, Farmington Hills, Mich.

Filed Oct. 29, 1987, Ser. No. 114,688
Int. Cl.[4] B65G *47/00*
U.S. Cl. 414—280 **6 Claims**

1. A storage and retrieval machine for transporting tote pans to and from storage compartments arranged longitudinally in vertical rows along an aisle; each tote pan having a bottom, a pair of sides and a pair of ends each provided with a handle in the form of a downwardly facing slot; and said machine including a vertically movable carriage comprising:

a base frame;

a tote pan support assembly mounted on said base frame for transverse movement toward and away from said storage compartments;

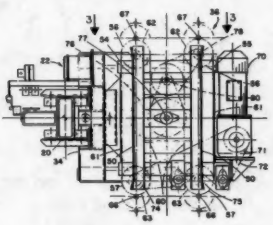
said tote pan support assembly having a pair of longitudinally spaced transversely extending parallel guides adapted to be engaged by side and bottom portions of a tote pan;

tote pan engaging means mounted on said tote pan support assembly for moving a tote pan between said guides and a selected one of said storage compartments, said engaging means comprising

a pair of endless chains each associated with one of said pair of parallel guides below the tote pan support level thereof, each chain being trained about a pair of sprockets carried by said support assembly on vertical axes located adjacent to the opposite ends of the associated one of said parallel guides and having inner and outer reaches extending parallel to and on opposite sides of said one guide and having opposite arcuate end reaches extending outwardly of each end of said one guide;

a pair of tote pan engaging pins attached to each chain in equidistantly spaced relation, the pair of pins on one of said chains having relative longitudinal positional alignment with the pair of pins on the other of said chains, said pins projecting upwardly from said chains above the support level of said guides;

said support assembly having a normal position centered transversely on said base frame and in which normal position the pair of pins on each of said pair of chains is



disposed in substantially transversely aligned relation with the associated one of said pair of parallel guides; and

reversible driving means for operating said support assembly in a storage or retrieval cycle from said normal position and return thereto, said driving means including chain propelling means for synchronously moving said pair of chains in opposite directions with each chain making a complete orbit about its pair of sprockets during said cycle, and shifting means driven by said driving means for simultaneously moving said support assembly transversely on said base frame from said normal position to a tote pan transfer position at the midpoint of said cycle, whereby in a storage cycle a tote pan supported on said parallel guides and having its handle slots engaged by said pins is pushed into a storage compartment by a longitudinally aligned pair of pins on said chains moving on the said inner reaches thereof and is disengaged from said aligned pins moving to said outer reaches on corresponding arcuate end reaches thereof adjacent to the storage compartment as said support assembly passes through said tote pan transfer position, and

whereby in a retrieval cycle a tote pan in a storage compartment and having one of its handle slots adjacent said aisle is engaged by a longitudinally aligned pair of pins on said chains moving from said outer reaches around corresponding end reaches thereof adjacent to the storage compartment and entering opposite ends of said one handle slot as said support assembly passes through said tote pan transfer position, and said tote pan is pulled onto said parallel guides as the longitudinally aligned, handle engaging pair of pins move on the inner reaches of said chains and the support assembly returns to the centered position.

4,812,103

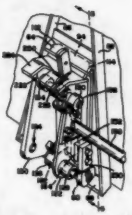
IMPLEMENT-COUPLING ASSEMBLY FOR MATERIAL-HANDLING APPARATUS

Gary L. Cochran, Racine; Ronald D. Seeley, Waterford; Donald G. Shelton, Burlington, all of Wis., and Gary D. Stromberg, Derby, Kans., assignors to J. I. Case Company, Racine, Wis.

Filed Mar. 22, 1988, Ser. No. 171,864

Int. Cl.[4] E02F 3/28

U.S. Cl. 414—723 **21 Claims**



1. For use with material-handling apparatus having lifting and tilting means, a combination comprising:

(a) a material-handling implement and a female coupling structure, which is integral with the implement, the implement and female coupling structure together including

(1) an upstanding back plate having a back surface,

(2) an upper flange extending rigidly and backwardly from the back plate and having a downwardly and backwardly sloping lower surface, and

(3) a block mounted to the back plate, the block having an upper surface; and

(b) a male coupling structure adapted to be operatively mounted to the lifting and tilting means and to be selectively coupled to and uncoupled from the female coupling structure, the male coupling structure including

(1) an upstanding front plate having a front surface, which is adapted to be generally parallel to the back surface of the back plate when the male coupling member is coupled to the female coupling structure,

(2) an upper flange extending rigidly from the front plate and having a sloping upper surface, which is adapted to bear against the lower surface of the upper flange of the female coupling structure when the male coupling structure is coupled to the female coupling structure, and

(3) a vertical bracket extending rigidly and backwardly from the front plate, and

(4) a member having a lower surface and being mounted to the vertical bracket so that the lower surface of the member faces the upper surface of the block when the male coupling structure is coupled to the female coupling structure, and

(c) means for releasably latching the male coupling structure releasably to the female coupling structure when the male coupling structure is coupled to the female coupling structure;

wherein a selected one of the member and the block is mounted fixedly and wherein the other one of the member and the block is mounted adjustably and is adjustable so that the lower surface of the member and the upper surface of the block are spaced by a selected gap;

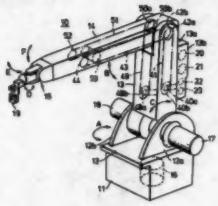
whereby vertical play between the male coupling structure and the female coupling structure does not exceed the selected gap between the lower surface of the adjustable member and the upper surface of the block when the male coupling structure is coupled to the female coupling structure.

4,812,104

ELECTRICAL ROBOT

Hiroshi Suzuki, Yokohama, Japan, assignor to Tokico Ltd., Japan

Filed Sep. 8, 1987, Ser. No. 94,394
Claims priority, application Japan, Sep. 17, 1986, 61-218790
Int. Cl.[4] B25J 9/06
U.S. Cl. 414—735 5 Claims



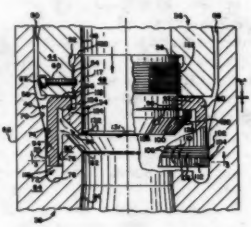
1. An electrical robot comprising:
a base;
a rotary base rotatably provided on said base;
a support beam provided on said rotary base and free to turn about a base end of said support beam;
an arm supported on a distal end of said support beam and free to turn about a base end of said arm;
a wrist mechanism provided on a distal end of said arm and having at least one degree of freedom of motion;
a transmitting mechanism for transmitting a driving force to said wrist mechanism; and
driving means including at least one motor for driving said wrist mechanism through said transmitting mechanism,
said transmitting mechanism having at least one reduction gear for reducing a driving force transmitted to said wrist mechanism,
said driving means and said reduction gear being mounted sideways at an intermediate portion on a rear part of said support beam .

4,812,105

BELL SEAL AND RETAINING NUT FOR HIGH PRESSURE TURBINES

Frank J. Heymann, Winter Springs, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 18, 1988, Ser. No. 157,553
Int. Cl.[4] F01D 25/26
U.S. Cl. 415—134 15 Claims



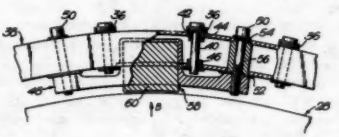
1. A bell seal assembly comprising, in combination, a bell seal unit and a retaining nut unit, said bell seal unit including a radially inwardly extending flange with an upper end face sealing surface, a lower flange support surface, and a generally cylindrical skirt portion depending from said flange and including a lower skirt margin terminating in a skirt end surface, said lower skirt margin having its radially outer surface subdivided into a labyrinth seal region and a guiding and wear resisting region, said labyrinth seal region including plural, spaced apart seal lands separated by circumferentially extending seal grooves, and said guiding and wear resisting region comprising a plurality of alternating guide lands and grooves extending axially inwardly from said skirt end surface, said sealing lands and said guide lands being adapted in use to be spaced closely apart by no more than a working clearance from an adjacently disposed, radially inwardly directed sidewall sealing surface of a turbine nozzle chamber when said seal is at a given, lower temperature and to be urged into snug radial sealing engagement with said sealing surface of said nozzle chamber when said nozzle chamber and said seal are at an elevated temperature, said bell unit being positioned by said retaining nut for free but limited axial movement such that said upper end face sealing surface is spaced just apart from a cooperating bottom end face sealing surface on an associated inlet sleeve, but is movable to a position of end face engagement with said inlet sleeve lower end face surface in response to an increase in fluid pressure in the interior or said seal assembly.

4,812,106

VARIABLE STATOR VANE ARRANGEMENT FOR A COMPRESSOR

Duncan G. Purgavie, Derby, England, assignor to Rolls-Royce plc, London, England

Filed Apr. 27, 1988, Ser. No. 187,027
Claims priority, application United Kingdom, Jun. 30, 1987, 8715314
Int. Cl.[4] F01D 9/04, 17/16, 25/28
U.S. Cl. 415—139 7 Claims



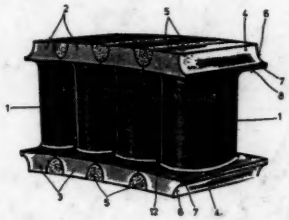
1. A variable stator vane arrangement for an axial flow compressor comprising a stator casing, a plurality of variable stator vanes, a control ring, a plurality of operating levers, and a plurality of pieces of material,
the variable stator vanes being circumferentially spaced apart and extending radially, each variable stator vane being rotatably mounted on the stator casing,
the control ring surrounding and being arranged coaxially with the stator casing, each variable stator vane being connected to the control ring by one of the plurality of operating levers, the control ring being spaced radially from the stator casing by a clearance,
the pieces of material being arranged circumferentially and being positioned radially between the control ring and the stator casing, the pieces of material having a relatively high coefficient of expansion to control the clearance between the control ring and the stator casing whereby any error of the variable stator vane angular position is reduced.

4,812,107

METHOD OF MANUFACTURING A CONTROL WHEEL FOR THE HIGH-PRESSURE ROTOR OF A STEAM TURBINE

Santino Barcella, Neuenhof, Switzerland; Manfred Befeld, Ludwigshafen, Fed. Rep. of Germany; Guy Faber, Oberrohrdorf, and Paul Slepcevic, Nussbaumen, both of Switzerland, assignors to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Filed Feb. 24, 1986, Ser. No. 832,334
Claims priority, application Switzerland, Feb. 28, 1985, 910/85
Int. Cl.[4] F01D 5/30
U.S. Cl. 416—191 6 Claims



1. A method of manufacturing a control wheel for a high-pressure rotor in a steam turbine, said control wheel being formed from a rotor disk and a plurality of individual blades, each of said blades including a root platform and a shroud, said method comprising the steps of:

assembling said blades together to form a ring,

welding said assembled blades to their neighboring blades at the root platforms and the shrouds so that closed rings are formed by the root platforms and the shrouds,

isothermally transforming the weld material and the ring by heating the ring after the welding to an annealing temperature in the absence of cooling,

heat-treating the ring subsequent to the welding so that the weld connections have substantially the same properties as the ring, and

assembling the ring onto the rotor disk.

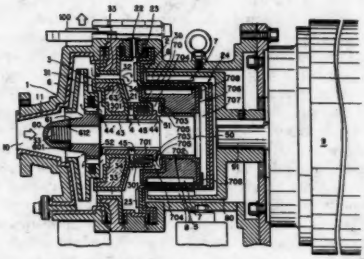
4,812,108

MAGNET PUMP

Masayuki Kotera, Mishima, Japan, assignor to Seikow Chemical Engineering & Machinery Ltd., Hyogo, Japan

Filed Sep. 22, 1987, Ser. No. 99,882
Claims priority, application Japan, Sep. 25, 1986, 61-146924
Int. Cl.[4] F04B 39/02
U.S. Cl. 417—368 5 Claims

1. A magnet pump comprising a front casing, a rear casing provided behind the front casing with a partition wall interposed therebetween, a rotary shaft extending from the front casing into the rear casing and supported by a bearing device provided in the partition wall, an impeller fixed to the rotary shaft within the front casing, a driven magnet drivingly connected to the rotary shaft within the rear casing and a drive magnet provided outside the rear casing and being drivingly rotatable by a motor, the bearing device being formed at an intermediate portion thereof with lubricant supply channels, the partition wall having bores therethrough, opposed to the rear plate of the impeller for guiding the liquid within the front casing into the rear casing, the rear casing having a supply bore therethrough for supplying a lubricant from outside into the rear casing, guide blades for guiding the liquid from the rear casing into the channels of the bearing device being provided on at least one of the surface of partition wall and the surface of the rear casing which define the interior space of the rear casing, and said magnet pump further comprising a driven magnet holding member, a space formed between the rear end face of the driven magnet holding member and the rear wall of the rear casing, the driven magnet holding member having a small inside diameter portion drivingly connected to the rotary shaft axially thereof and a large inside diameter portion extending forwardly of the small inside diameter portion and defining, with the small inside diameter portion, a stepped portion,



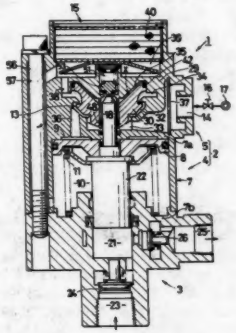
the front end portion of the large inside diameter portion being positioned around the bearing holder with a small clearance formed therebetween, the stepped portion defined by the large inside diameter portion and the small inside diameter portion being provided with blades for providing increased liquid pressure in a space between for stepped portion and the small clearance, and the bearing holder being provided with blades in the rear of the end face thereof for providing reduced liquid pressure in the space between the rear of the end face thereof and the rear wall of the rear casing.

4,812,109

APPARATUS FOR DRIVING PISTON BY FLUID PRESSURE

Keitaro Yonezawa, Hyoken, Japan, assignor to Kabushiki Kaisha Kosmek, Hyogoken, Japan

Filed Nov. 17, 1987, Ser. No. 121,911
Claims priority, application Japan, Nov. 17, 1986, 61-274836
Int. Cl.[4] F04B 9/12
U.S. Cl. 417—401 5 Claims



1. In an apparatus for driving a piston by fluid pressure, wherein a piston is slidably inserted into a cylinder; an actuation chest is formed between the upper wall of the cylinder and the piston; the piston is driven toward the lower dead point

thereof by the fluid pressure in the actuation chest and toward the upper dead point thereof by a spring; and the actuation chest is connected either to a supply port or to a discharge port through a supply-discharge valve; and a pilot valve allows the supply-discharge valve to take the supply position X and the discharge position Y; and the supply-discharge valve is so constructed that the supply-discharge valve is a disc disposed above the cylinder movable up to the upper dead point and down to the lower dead point in a supply-discharge valve casing; and in the supply-discharge valve casing, an operation valve chest is formed on the outer circumferential face of the supply-discharge valve disc, and a supply valve chest is disposed one side of supply-discharge valve disc; and a discharge valve chest and a pilot actuation chest are disposed another side of the supply-discharge valve disc; and the operation valve chest, the supply valve chest, and the discharge valve chest are communicated with the actuation chest of the cylinder, the supply port, and the discharge port, respectively; and the pilot actuation chest is communicated with the supply port through a sealing ring-constructed discharge operation valve element of the pilot valve; and the cross-sectional area of the pilot actuation chest is greater than the cross-sectional area of the supply valve chest; and the pilot valve is so constructed that a spool-shaped pilot valve element is movable up and down in a pilot valve chest which extends vertically through a cylindrical face mounted in the center of the supply discharge valve disc; and a pilot valve element is connected with the piston; and when the pilot valve element is in the vicinity of the lower dead point, it opens the discharge operation valve element so as to communicate the pilot valve actuation chest with the supply port and when the pilot valve element is in the vicinity of the upper dead point, it opens a supply operation valve element so as to communicate the pilot actuation chest with a pressure relief port, comprising: the supply valve chest disposed below the supply-discharge valve disc, and the discharge valve chest and the pilot actuation chest disposed above the supply-discharge valve disc, wherein the diameter of the supply valve-face, of the supply-discharge valve disc, which confronts the supply valve chest is smaller than the diameter of the discharge valve face, of the supply-discharge valve disc, which confronts the discharge valve chest; and the area of the supply valve-face which has been closed and receives pressure when the supply valve-face starts to open is smaller than the area of the discharge valve-face which receives pressure when the supply valve-face has finished opening with the discharge valve face closed; and the area of the valve-face which confronts the pilot actuation chest and receives pressure from the pilot actuation chest is greater than the area of the discharge valve-face which receives pressure when the supply valve-face has finished opening; and the inner circumferential face of a sealing ring-constructed discharge operation valve element and the outer circumferential face thereof slidably contact with a pilot valve element and the cylindrical circumferential face of the supply-discharge valve disc, respectively so as to be sealed by the sealing ring-constructed discharge operation valve element; and the upper face of the discharge operation valve element is received by the lower face of a receiving member, and the upper portion of the receiving member is fixed to a supply-discharge valve casing.

4,812,110

OIL-FREE SCREW COMPRESSOR WITH BYPASS OF COOLED DISCHARGED GAS

Kazuo Kubo, Kobe; Noboru Tsuboi, Kakogawa; Kunihiko Nishitani, Akashi, and Ituro Nomura, Takarazuka, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jul. 30, 1987, Ser. No. 79,397

Claims priority, application Japan, Aug. 11, 1986, 61-188864; Dec. 19, 1986, 61-304957

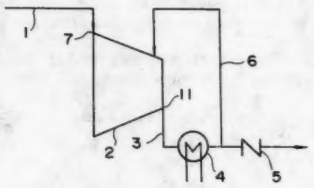
Int. Cl.[4] F04C *18/16, 29/04*

U.S. Cl. 418—1 **1 Claim**

1. A method for operating an oil-free screw compressor, which comprises:

feeding a gas of a temperature Ta to a discharge space in the vicinity of a discharge port of said compressor, the temperature Ta satisfying the relationship:

$$Ta \leq T1/k$$



wherein Ta is the temperature (°K.) of said feed gas; T1 is the temperature (°K.) of the compressed gas before feeding; and k is a polytropic index number.

4,812,111

VARIABLE DISPLACEMENT ROTARY FLUID MACHINE

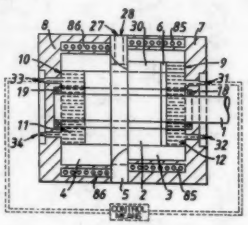
Cyril J. A. Thomas, 49 Central Ave., Pinner, Middlesex, Great Britain HA5 5BT

Continuation of Ser. No. 894,686, Aug. 8, 1986, abandoned. This application May 17, 1988, Ser. No. 198,701

Claims priority, application United Kingdom, Aug. 9, 1985, 8520097

Int. Cl.[4] F01C *1/10, 21/16*

U.S. Cl. 418—20 **7 Claims**



1. A variable displacement fluid machine comprising: an externally lobed first wheel mounted for rotation in a casing and at least partially received within an internally lobed second wheel eccentrically mounted with respect to said first wheel for rotation in said casing, the lobes of said first wheel engaging the lobes of said second wheel so that rotation of one of said wheels induces rotation of the other of said wheels and forms displacement chambers which progressively decrease and increase in volume on rotation of said wheels, a third wheel mounted for rotation in said casing and longitudinally adjacent said second wheel and concentric with said first wheel, said first wheel being longitudinally displaceably received into an axially extending passage in said third wheel, said passage being internally profiled to sealingly engage the lobed periphery of said first wheel and to close one end of said displacement chambers;

said casing having two radially inwardly directed and circumferentially spaced sealing sections which are disposed longitudinally between said second and third wheels;

the third wheel having a sealing surface which sealingly abuts said sealing sections and said third wheel sealingly abutting said second wheel radially inwardly of said sealing sections to form a nonrotatable outlet chamber and a nonrotatable inlet chamber which are sealed from each

other and which are adjacent to and communicate with said displacement chambers, said outlet chamber communicating directly with displacement chambers which contract during rotation of said first and second wheels and said inlet chamber communicating directly with displacement chambers which expand during rotation of said first and second wheels;

a fluid inlet port in the casing which communicates with the inlet chamber and a fluid outlet port in the casing which communicates with the outlet chamber;

first and second control chambers provided in said casing and communicating with longitudinally opposed ends of the first wheel, said control chambers being subjected to variable fluid pressure by a control means to move said first wheel longitudinally, and a seal longitudinally slidably and sealingly engaging the lobed interior surfaces of said second wheel and sealingly engaging a second end of said first wheel received within said second wheel to close the end of each of said displacement chambers longitudinally remote from said inlet and outlet chambers whereby longitudinal displacement of said first wheel by varying the fluid pressure in the control chambers varies the capacity of the displacement chambers.

4,812,112

APPARATUS FOR MAKING A SPUN FLEECE FROM ENDLESS SYNTHETIC-RESIN FILAMENT

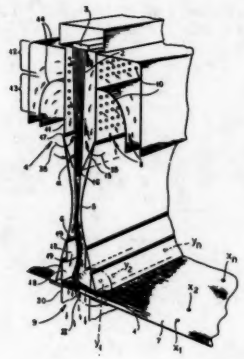
Hermann Balk, Troisdorf, Fed. Rep. of Germany, assignor to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Filed Nov. 10, 1987, Ser. No. 119,197

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1987, 3713861

Int. Cl.[4] B29C *47/34*

U.S. Cl. 425—66 **4 Claims**



1. An apparatus for making a spun filament fleece comprising:

a spinneret;

a cooling shaft provided with a stretching gap, said cooling shaft having a shaft wall provided with a plurality of air orifices and process air required for cooling being introducible through said air orifices to provide an air flow;

a diffuser shaft;

a continuously moving fleece receiving conveyor;

as device for feeding process air and for drawing outflowing air through said fleece receiving conveyor, said air flow being at least partially passed through said fleece receiving conveyor;

at least two opposing elastically deformable pivoting flaps each having a horizontal pivot axis which are provided in said diffuser shaft below said wall and whose setting angles are synchronously adjustable against said air flow defined by the deviation of measured values of received lengths of a plurality of endless filament loops from set values; and

an adjustable damper below said fleece delivery conveyor combined with said device for feeding said process air and for drawing said outflowing air with which the width of said air flow measured in the transport direction of said fleece receiving conveyor is adjustable, said flaps being adjustable to different setting angles over the entire length of each of said pivoting flaps.

4,812,113

MOLD ASSEMBLY FOR PRE-STRESSED CONCRETE RAILROAD TIES

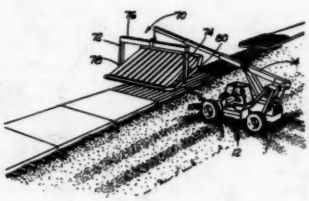
Steven L. Jaatzen, 208 S. State St., Jerseyville, Ill. 62053

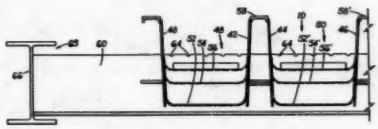
Division of Ser. No. 930,514, Nov. 14, 1986, Pat. No. 4,781,875, which is a continuation of Ser. No. 779,804, Sep. 24, 1985, abandoned, which is a continuation of Ser. No. 550,370, Nov. 10, 1983, abandoned. This application Oct. 21, 1987, Ser. No. 110,731

The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.

Int. Cl.[4] B28B *7/16*

U.S. Cl. 425—111 **6 Claims**





1. A mold assembly for the manufacture of prestressed concrete railroad ties comprising:

prestressed concrete molds supported by existing track near the area where the ties are to be installed;

each mold having a plurality of components to form a number of ties including transverse end portions of each mold having means to locate reinforcing strands within each tie at a single level at a position sufficiently close to a neutral axis to minimize stress fluctuations; wherein each mold has a bottom that is contoured with inclined portions to provide a desired tie cross section which varies in a manner designed to carry the compressive and tensile loads applied to the tie by the wheels of rail cars and at the same time minimize the amount of concrete required;

means for pouring concrete into the mold;

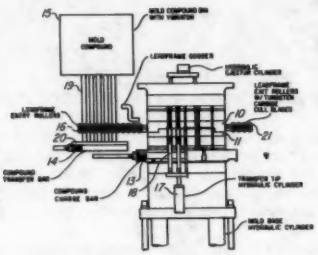
extractor means for removing a group of ties simulatenously from a given mold;

said extractor means having means for simultaneously clamping the reinforcing strands extending outwardly from a given mold and means for lifting the strands as a group from the mold.

4,812,114
NEW IC MOLDING PROCESS

James A. Kennon, Dennison; Shafidul Islam, Plano, both of Tex.; Jeffrey L. Popken, Cincinatti, Ohio; Jerry B. Medders, Van Alstyne; Susan S. Fitzgerald, Fort Worth, both of Tex.; Donald R. Kelley, Sherman, Tex., and Philip A. Burr, Aguascalientes, Mexico, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 30, 1987, Ser. No. 103,555
Int. Cl.[4] B29C *45/18*
U.S. Cl. 425—116 13 Claims

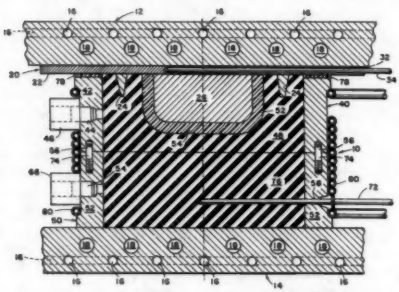


1. A multiple charge transfer apparatus for receiving a semiconductor lead frame having a semiconductor mounted thereon and gold wire bonded to the lead pins on the lead frame, the molding system including upper and lower mold chases, hydraulic means activated to inset the lower mold chase with the upper mold chase, each chase having at least one mold cavity corresponding to the mold cavity in the other chase, a charge bar, a compound transfer bar, and a mold compound supply chamber, said compound transfer bar movable in line with the compound supply chamber to receive a charge of molding compound and said compound transfer bar movable in line with the compound transfer bar to received mold compound, the compound transfer bar has been movable from the compound transfer bar to a position in-line with the lower chase for supplying mold compound thereto.

4,812,115
FIXED-VOLUME TRAPPED RUBBER MOLDING APPARATUS

Daniel N. Kemp, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Oct. 5, 1987, Ser. No. 105,108
Int. Cl.[4] B29C *43/10*
U.S. Cl. 425—405.2 31 Claims

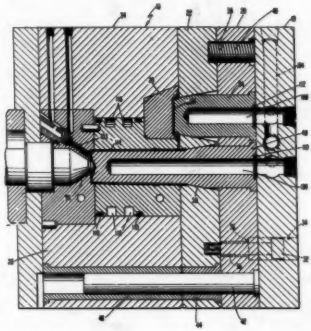


1. A molding apparatus for subjecting a part to be molded to a predetermined sequence of increased temperatures and pressures, said apparatus comprising: a fixed-volume, rigid mold having a die positioned therein, said die having a working surface shaped so as to conform to the configuration of the part to be molded, said mold containing a cured elastomer which, at least in an area adjacent the die, is an integral solid, said elastomer conforming generally to the interior configuration of said mold and being spaced from said working surface a distance sufficient to accommodate the part to be molded, said elastomer having a relatively high coefficient of thermal expansion and a relatively low coefficient of thermal conductivity, at least the integral solid portion of the elastomer having a relatively low modulus of elasticity, said die and the cured elastomer surrounding it occupying one zone of the interior of said mold, a second zone of the interior of said mold containing additional cured elastomer; first heating means for selectively heating the die and at least a portion of the cured elastomer in said one zone; first cooling means for selectively cooling the die and at least a portion of the cured elastomer in said one zone; second heating means independent of said first heating means for selectively heating at least a portion of the additional cured elastomer contained within said second zone; second cooling means independent of said first cooling means for selectively cooling at least a portion of the additional cured elastomer contained within said second zone; whereby the part to be molded can be selectively and independently subjected to increases and decreases in temperature and pressure by control of said first and second heating and cooling means.

4,812,116
MOLD FOR MAKING AN ASEPTIC VIAL AND CAP

Robert S. Abrams, 21 Marion Ave., Albany, N.Y. 12203

Division of Ser. No. 928,475, Nov. 10, 1986, Pat. No. 4,783,056.
This application Jun. 30, 1988, Ser. No. 213,846
Int. Cl.[4] B29C *33/02, 33/10, 45/34, 45/03*
U.S. Cl. 425—547 19 Claims

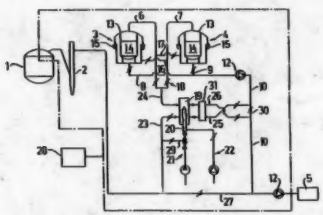


1. A mold for forming a vial and cap, comprising:
a frame for the mold;
a second mold part arranged on said frame;
a first mold part arranged adjacent said second mold part so as to define a first cavity for forming a vial and a second cavity for forming a cap therebetween, said first mold part being movable relative to said second mold part;
means mounted on the second mold part for seating said cap on said vial while the vial is within the second mold part;
means on the mold for providing a molded vial and cap with interlocking annular regions, said regions including rounded transition surfaces for accommodating each other.

4,812,117
METHOD AND DEVICE FOR PRE-HEATING WASTE METAL FOR FURNACES

Staffan Granström, Öjebyn, Sweden, assignor to NAB-Konsult, PiteÅ, Sweden

PCT No. PCT/SE87/00195, § 371 Date Dec. 14, 1987, § 102(e) Date Dec. 14, 1987, PCT Pub. No. WO87/06331, PCT Pub. Date Oct. 22, 1987
PCT Filed Apr. 15, 1987, Ser. No. 133,065
Claims priority, application Sweden, Apr. 15, 1986, 860169
Int. Cl.[4] F27D 3/00
U.S. Cl. 432—9 15 Claims



1. A method for pre-heating waste metal for furnaces comprising:

(a) generating flue gases in a furnace;

(b) supplying said flue gases to at least one of a plurality of pre-heating chambers, each having a waste metal container;

(c) prior to (b), flowing said flue gases through a combustion chamber provided with a burner which produces hot gases and admixing said hot gases from said burner with said furnace flue gases and superheating said admixture;

(d) supplying burnt flue gases from said pre-heating chambers to a gas cleaning plant;

(e) recirculating unburnt flue gases from said pre-heating chambers to said combustion chamber;

(f) post-combusting said recirculated unburnt flue gases in said combustion chamber; and

(g) supplying said post-combusted burnt flue gases to said gas cleaning plant.

9. A device for pre-heating waste metal for furnaces, comprising:

a plurality of pre-heating chambers with waste metal containers in communication with said furnace;

a combustion chamber provided with a burner capable of producing a variable amount of hot gases for admixture with the flue gases from said furnace and of superheating the admixture;

said combustion chamber comprising an inlet in communication with said furnace for receiving flue gases generated in said furnace,

an outlet in communication with said pre-heating chambers for superheated flue gases,

an inlet in communication with said pre-heating chambers for receiving unburnt flue gases,

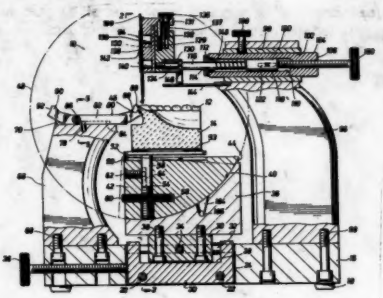
an outlet in communication with a gas cleaning plate for burnt flue gases and

a by-pass duct disposed between said unburnt pre-heating chamber flue gas inlet and said burnt combustion chamber flue gas outlet for supply of burnt flue gases from said pre-heating chamber direct to said gas cleaning plant.

4,812,118
PLACEMENT APPARATUS FOR LINGUAL AND BUCCAL BRACKETS

Thomas D. Creekmore, 362 Piney Point, Houston, Tex. 77024

Filed Apr. 3, 1987, Ser. No. 33,721
Int. Cl.[4] A61C 3/00
U.S. Cl. 433—2 36 Claims



1. Apparatus for selectively placing edgewise orthodontic brackets on the lingual and labial surfaces of a model of a patient's malocculded teeth and in relation to an ideal dental arch plane, comprising:

(a) base means

(b) tooth orienting means projecting from said base means and establishing optimum labial and buccal surface positions of the malocculded teeth of a dental model to permit archwire induced force application to orthodontic brackets on a patient's teeth to establish optimum tip, rotation, torque, in-out and height movement of selected teeth relative to a preselected dental arch;

(c) model support means being omnidirectionally movable for selectively positioning individual teeth of said model relative to said tooth orienting means, said model support means defining a spherical surface segment having a centroid region, said tooth orienting means being located in said centroid region and said spherical surface segment of said model support means being movable about said centroid region for positioning selected teeth of said model in said centroid region; and

(d) bracket support means for individually supporting edgewise orthodontic brackets and being movable to position said edgewise orthodontic brackets such that the archwire slots thereof are located at selected lingual and labial positions relative to said preselected dental arch for attachment thereof to respective teeth of said model.

4,812,119
METHOD OF MIXING DENTAL IMPRESSION MATERIALS AND DEVICE THEREFOR

William B. Hewitt, 118 Springwater Dr., Columbia, S.C. 29223

Filed Jun. 23, 1987, Ser. No. 65,347
Int. Cl.[4] A61C 9/00
U.S. Cl. 433—49 6 Claims

1. A device for mixing dental impression material comprising:

(a) a fixed mixing surface comprising a plate constructed of non-resilient material;

(b) means for rotating said surface; and

(c) means for detachably securing said first surface to said rotating means whereby a plurality of first dental impression materials may be homogeneously mixed together on said first surface as the operator manually manipulates said materials, said securing means comprising a plurality of pins on a selected one of said plate or said turntable and a

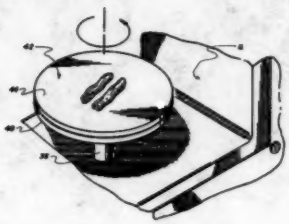
plurality of openings in registry with said pins in the other of said plate or said turntable.

5. A method of preparing a dental impression, comprising the steps of:

(a) applying a plurality of first dental impression materials to a first surface that is detachably secured to a turntable;

(b) rotating said first surface and said turntable for a predetermined amount of time;

(c) incorporating together said materials as said surface is rotated so that a homogeneous first mixture of said materials is obtained;



(d) stopping the rotation of said first surface and said turntable;

(e) removing said first surface; installing a second surface on said turntable;

(g) repeating steps a-e for a second surface and plurality of second dental impression materials which are mixed thereon to form a homogeneous second mixture; and

(h) utilizing said first and second mixtures to obtain an impression of a patient's teeth.

4,812,120

IMPLANTABLE PERCUTANEOUS DEVICE

Dennis F. Flanagan, 129 Summit Rd., Storrs, Conn. 06268, and Stephen H. Clark, 347 Cooper La., Coventry, Conn. 06238

Filed Nov. 2, 1987, Ser. No. 115,401

Int. Cl.[4] A61C *8/00*

U.S. Cl. 433—173 **20 Claims**

1. A prosthetic dental device for percutaneous implantation, comprising a metal core component including a body portion, elongated in the direction of a first axis, and an integrally formed neck portion projecting therefrom along said first axis, said neck portion having a lateral surface extending thereabout and for a substantial distance therealong in the direction of said first axis; a thin first layer of a synthetic polymer substantially covering at least said lateral surface of said neck portion of said component, said first layer being applied directly to said metal and being firmly bonded thereto; a thin second layer of a synthetic polymer substantially covering said first layer, said second layer being applied directly to said first layer and being firmly bonded thereto; and a mass of biopolymer fibrils embedded in and secured by said second layer and projecting therefrom, said fibrils substantially covering at least said lateral surface of said neck portion of said core component and providing a napped surface thereover; said body portion of said core component having a surface character affording firm setting, immobility, rigidity and stability of the device when implanted.

4,812,121

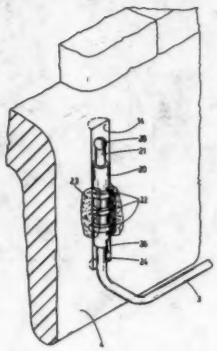
MANDIBULAR DENTURE STABILIZER

George C. Winder, 33 Regency Square, Scarborough, Ontario, Canada M3K 1G8

Filed May 10, 1988, Ser. No. 192,172

Int. Cl.[4] A61C *13/22*

U.S. Cl. 433—172 **9 Claims**



1. An improved stabilizer for a mandibular denture having an inner depending lingual flange; said stabilizer comprising an anchor means adapted to be secured to said lingual flange, appendage means adapted to fit under the patient's tongue, and fitting means for positively adjusting the position of the appendage means relative to the anchor means.

4,812,122

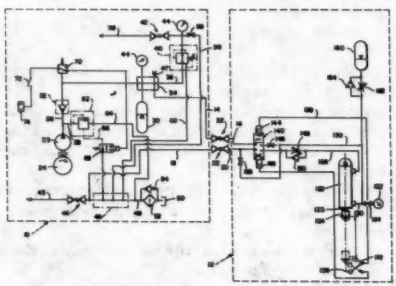
ARTILLERY TRAINING APPARATUS WITH RECOIL/COUNTERRECOIL SIMULATION

Helmar A. Mueller, York, Pa., assignor to Harsco Corporation, Wormleysburg, Pa.

Filed May 22, 1986, Ser. No. 865,802

Int. Cl.[4] F41F *27/00*

U.S. Cl. 434—18 **9 Claims**



1. Cannon system training apparatus for simulating movements of the cannon system which exist during firing for training operating crews without actual firing of the cannon system, comprising a gun tube supported by mounting means for reciprocal movement with respect to the mounting means between an in-battery position and a recoiled position; double acting

hydraulic cylinder means connected to the gun tube and to the mounting means for moving the gun tube from the in-battery position to the recoiled position and back to the in-battery position, the hydraulic cylinder means being responsive to hydraulic fluid supplied to a first inlet thereof for moving the gun tube in a first direction to said in-battery position to simulate a counterrecoil movement and being responsive to hydraulic fluid supplied to a second inlet thereof for moving the gun tube in a second direction to the recoiled position to simulate a recoil movement; a source of pressurized hydraulic fluid; an accumulator connected to said first inlet for receiving hydraulic fluid from the hydraulic cylinder means upon said movement to the recoiled position; and hydraulic control means for connecting the source of pressurized hydraulic fluid to said second inlet of the hydraulic cylinder means so as to cause the gun tube to move from said in-battery position to said recoiled position and, upon reaching said recoiled position, for disconnecting the source from said second inlet to enable pressurized hydraulic fluid from said accumulator to enter the first inlet and return the gun tube to said in-battery position, thereby causing said gun tube to execute recoil and counterrecoil motions.

4,812,123

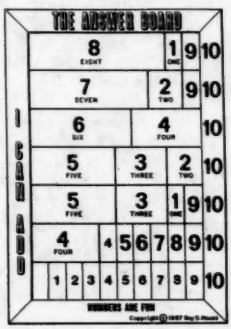
EDUCATIONAL DEVICE AND GAME

Roy D. House, Rte. 1, Stark City, Mo. 64866

Filed Jul. 16, 1987, Ser. No. 74,234

Int. Cl.[4] G09B *1/00, 19/02*

U.S. Cl. 434—195 **11 Claims**



1. An educational device comprising, in combination, a generally flat rectangular playing surface having a left side, a right side, a top edge, a bottom edge and a frame surrounding the playing surface, said playing surface having inscribed thereon a plurality of uniformily spaced apart horizontal indicia, extending, from the left side to the right side, and vertical line indicia, extending from the top edge to the bottom edge, which result in seven horizontal rows each containing ten boxes of equal horizontal dimension beginning at the left side of the playing surface and ending at the right side of the playing surface with each box in each row to the right of the left-most box containing a numerical indicia which increases in numerical order from left to right beginning with the number 1 and ending with the number 9, fifteen blocks having upper and lower surfaces and four edges each said block having vertical dimensions corresponding to the vertical distance between the horizontal lines of the playing surface and horizontal dimensions corresponding to the horizontal dimensions of one or more boxes, each said block having on at least one surface a numerical indicia corresponding to the number of boxes in a row of the playing surface that that particular block can exactly cover, there being two each of blocks sized to exactly cover 1,2,3,4, and 5 boxes respectively and one each of blocks sized to exactly cover 6,7,8,9 and 10 boxes respectively, wherein the numerical indicia in the boxes of the playing surface are selected from numerical indicia of first and second distinguishable print types, wherein the numerical indicia in the boxes of the first and second rows from the top edge are of the first type, and in the third row the box numerical indicia 1 is of the second type and the box numerical indicia 2–9 are of the first type, and in the fourth row the box numerical indicia 1 and 2 are of the second type and the box numerical indicia 3–9 are of the first type, and in the fifth row the box numerical indicia 1–3 are of the second type and the box numerial indicia 4–9 are of the first type, and in the sixth row the box numerical indicia 1–4 are of the second type and the box numerical indicia 5–9 are of the first type, and in the seventh row the all box numerical indicia are of the second type, and wherein there is located on the frame a numerical indicia 10 to the right of each row of boxes of the playing surface, each of said numerical indicia 10 on the frame being of the first type.

4,812,124

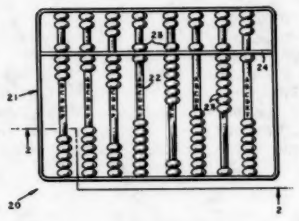
HEXADECIMAL ABACUS

Jesse L. Colodner, Pearl River, N.Y., and Lawrence A. Clopper, III, 39-70 46th St., Sunnyside, N.Y. 11104, assignors to Lawrence A. Clopper, Sunnyside, N.Y.

Filed Feb. 19, 1988, Ser. No. 157,580

Int. Cl.[4] G06C *1/00*

U.S. Cl. 434—203 **1 Claim**



1. A hexadecimal abacus comprising a substantially rectangular frame, a cross bar extending transversely within said frame, a plurality of rods extending within said frame through said cross bar from the top of said frame to the bottom of said frame in substantially perpendicular relation to said cross bar, and a plurality of beads slidably attached to said rods, said cross bar providing partition means for said plurality of beads, a first plurality of beads being slideably attached to said rods above said cross bar and a second plurality of beads being slideably attached to said rods below said cross bar, said first plurality of beads comprising three beads valued at eight points each, said second plurality of beads comprising eight beads valued at one point each, including letter character means inscribed in vertical alignment on the outer surface of said rods, said letter character means comprising the letters A, B, C, D, E and F.

4,812,125

INTERACTIVE TEACHING APPARATUS

Leonid Strashun, Reading, United Kingdom, assignor to Sony Corporation, Tokyo, Japan

Filed May 13, 1986, Ser. No. 862,634

Claims priority, application United Kingdom, May 29, 1985, 8513490; Feb. 27, 1986, 8604887

Int. Cl.[4] G09B *9/00*

U.S. Cl. 434—224 **13 Claims**

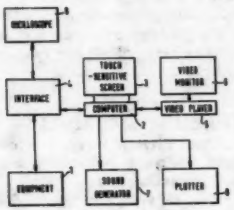
1. An interactive teaching apparatus comprising:

an actual equipment which is the ultimate object of a training or study and which is either an actual operative piece of equipment or a design breadboard, said equipment being intended for operation within a safe range of operation;

an interface coupled to said equipment for deriving data from test points in said equipment;

an interactive computer including a program for providing information ancillary to the teaching exercise, monitoring the progress of a trainee being taught, monitoring said data which is supplied from said interface to said computer, and guiding the trainee through stages of the program;

said computer being responsive to said data supplied from said interface to detect operation of said equipment outside said safe range of operation and to protect said equipment from malfunction due to the detected operation;



a reproduction device controlled by said computer and comprising a reproduction medium with pre-recorded instructional sequences containing teaching information concerning said equipment and sequences showing the possible consequences of any action by the trainee; and

display means capable of being coupled to said test points in said equipment so as to be supplied with signals from the test points for forming a display indicating the actual status of said test points, said display means also forming a reference display, whereby the conformity of said actual status to a reference status can be judged.

4,812,126

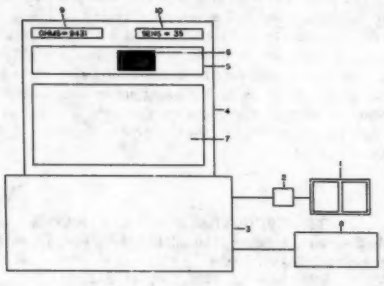
EDUCATION OR LEARNING AID METHOD

Byron Gilliksen, 6001 Idylwood Dr., Edina, Minn. 55436

Continuation-in-part of Ser. No. 737,794, May 28, 1985, abandoned. This application Jan. 21, 1987, Ser. No. 6,272

Int. Cl.[4] A61B *5/05*

U.S. Cl. 434—238 **4 Claims**



1. An educational or learning aid method comprising:

a computer,

software for the computer,

a CRT,

two electrodes in contact with the skin of a user so that the skin of the user acts as a resistor between the two electrodes,

a bridge circuit with the skin of the user as the variable resistor which is to be measured,

a means of applying a potential difference across the bridge circuit,

a means of detecting the changes in the current flowing from the bridge circuit so as to measure the changes in resistance in the skin of the user,

a means of converting the measured changes in the resistance in the skin of the user to a cognitive representation,

a means of asking questions of the user,

a computer keyboard used in conjunction with the computer and software, for setting variables in the software, starting the program, and answering questions posed if called for,

where the user is asked a question,

the bridge circuit measures the change in the user's skin resistance in response to the question and presents a cognitive representation of the change in skin resistance to the user,

the user selects a response to the question based on the observed change in his skin resistance and enters this response to the computer by use of the computer keyboard,

the computer then selects the next question to be posed to the user based on his response to the previous question in a programmed series of questions.

4,812,127

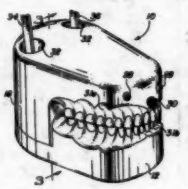
DENTAL HYGIENE TEACHING TOOL AND STORAGE DEVICE

Samson V. Hernandez, 44 W. 10th Dr., Mesa, Ariz. 85202

Filed Dec. 7, 1987, Ser. No. 129,597

Int. Cl.[4] G09B *23/28*

U.S. Cl. 434—264 **6 Claims**



1. A dental hygiene teaching tool and storage device in the form of a caricatured head comprising:

(a) a lipless lower jaw member including a front portion and a rear portion, with a set of fully exposed, realistic, simulated human lower gums being formed in said front portion;

(b) a lipless upper jaw member movably positioned on top of said lower jaw member, said upper jaw member including a front portion and a rear portion, with a realistic palate and a set of fully exposed, realistic, simulated human upper gums being formed in said front portion;

(c) a set of realistic, orthodontically correct, simulated human teeth, including a set of 16 upper teeth depending from said upper gums of said upper jaw member and a set of 16 lower teeth extending vertically upwardly from said lower gums of said lower jaw member, each set of teeth being symmetrical about an imaginary central axis which divides each jaw into a left side and a right side, with each side of each jaw including three simulated molars, two simulated bicuspids, one simulated cuspid, one simulated lateral tooth, and one simulated central tooth;

(d) a pair of eyes and a nose formed on the front portion of said upper jaw member above said upper gums to provide said caricatured head with a whimsical facial appearance;

(e) a well for receiving a container of dental floss; and

(f) a plurality of elongated bores extending through the rear

portion of said upper jaws for receiving a plurality of vertically upstanding, elongated dental hygiene implements.

4,812,128

THREE-DIMENSIONAL MOLECULAR MODEL

Raik-Khilo N. Mikelsaar, Tartu, U.S.S.R., assignor to Tartusshy gosudarstvenny Universitet, Tartu, U.S.S.R.

PCT No. PCT/SU82/00036, § 371 Date Jul. 19, 1984, § 102(e) Date Jul. 19, 1984, PCT Pub. No. WO84/02599, PCT Pub. Date Jul. 5, 1984

PCT Filed Dec. 24, 1983, Ser. No. 638,478

Int. Cl.[4] G09B *27/02, 23/26*

U.S. Cl. 434—278 **2 Claims**

1. A three-dimensional molecular model comprising at least three plastic modules having a polyhedral shape connected together to simulate atoms of aplanar cyclic compounds having no more than five constituent elements in each of said cyclic compounds and wherein adjacent plastic modules are arranged in said molecular model with faces touching, having a common apex, and having a sum of angles formed by said faces of said adjacent plastic modules equaling more than 360°.

4,812,129

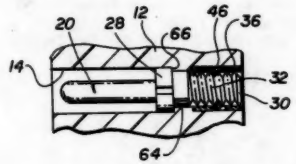
SURFACE MOUNT CONNECTOR

David Rofer, Fountain Valley; Peter J. Hyzin, El Toro, and Thomas W. Conrad, Altadena, all of Calif., assignors to ITT Corporation, New York, N.Y.

Filed Aug. 6, 1987, Ser. No. 82,267

Int. Cl.[4] H05K *1/00*

U.S. Cl. 439—79 **6 Claims**



1. An electrical connector comprising:

an insulator having a front face and a rear face with at least one contact passage extending therethrough opening at said faces;

a contact mounted in said passage, said contact having a forward mating section and a rear termination section;

said forward section of said contact being mounted in said passage from said front face;

said rear section of said contact being mounted in said passage from said rear face;

said forward section of said contact having a mating portion adjacent to said front face and a rear portion adjacent to said rear face;

said rear section of said contact embodying a generally tubular forward portion surrounding said rear portion of said front section of said contact, said tubular portion being slidably mounted in said passage;

said rear portion of said forward section of said contact embodying a generally forwardly facing shoulder;

means connecting said rear section of said contact to said rear portion of said front section of said contact, said connecting means comprising a radially movable resilient finger extending inwardly and rearwardly from said tubular portion with its end engaging shoulder;

means restricting axial movement of said contact in said passage; and

said rear section of said contact embodying a terminal extending rearwardly from said rear face of said insulator.

4,812,130

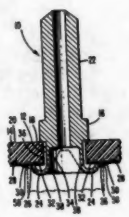
PRINTED CIRCUIT BOARD WITH MOUNTED TERMINAL

Raymond A. Altenschulte, New Palestine, and Glen M. Grabow, Indianapolis, both of Ind., assignors to RCA Licensing Corp., Princeton, N.J.

Filed Jun. 27, 1985, Ser. No. 749,270

Int. Cl.[4] H01R *4/06*

U.S. Cl. 439—84 **11 Claims**



1. In a printed circuit board including a conductive cylindrically-shaped tube mounted in an aperture extending therethrough, said tube having a shoulder portion adjacent a side surface thereof contacting one surface of said board adjacent said aperture and a bottom portion flaring outward to contact a conductive coating disposed adjacent said aperture on a surface of said board opposite the one surface, the improvement comprising:

said bottom portion being rolled over sufficiently to allow a distal end surface of the bottom portion adjacent said side surface to contact said conductive coating at an orientation wherein said distal end surface is substantially parallel to said coating, there being a clearance between the side surface of said cylindrically-shaped tube and the entire edge of both said aperture and said coating.

4,812,131

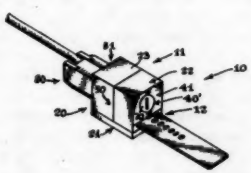
ELECTRICAL PLUG LOCK APPARATUS

Terry L. Sieverman, 12 N. Sherry La., Bellevue, Ky. 41073

Filed Mar. 23, 1988, Ser. No. 172,162

Int. Cl.[4] H01R *13/44*

U.S. Cl. 439—134 **5 Claims**



1. A lock apparatus for use in combination with an electrical cord and a plug having prongs wherein the lock apparatus comprises:

a housing unit comprising a generally rectangular housing member including a lower base portion; an upper plug receiving portion; an upper lock receiving portion; and, an elongated generally rectangular slot which extends through said housing member; and,

a locking unit comprising a key actuated locking mechanism which is disposed in the upper lock receiving portion of the housing unit and provided with a latch detent that is adapted to extend into said generally elongated rectangular slot in the housing unit; and, a plug capture member including an elongated male stem element that is dimensioned to be slideably received within said generally rectangular slot wherein one end of the male stem element is provided with a pair of capture arms which are adapted to engage the rear of the electrical plug.

4,812,132

ARRANGEMENT FOR DISTRIBUTING A CABLE ASSEMBLAGE BETWEN TWO MUTUALLY ROTATABLE COMPONENT PARTS

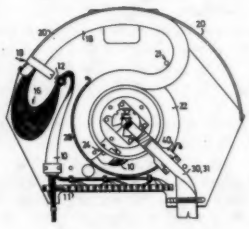
Sven-Eric Gunnarsson, Västerås, Sweden, assignor to Asea AB, Västerås, Sweden

Filed May 13, 1987, Ser. No. 49,222

Claims priority, application Sweden, May 16, 1986, 8602245; May 16, 1986, 8602246

Int. Cl.[4] H01R *39/02*

U.S. Cl. 439—164 **9 Claims**



1. An arrangement for distributing a cable assembly between two parts which are journalled for limited rotation relative to one another, said cable assemblage comprising two or more signal transmission cables, preferably in the form of multi-conductor ribbon cables, characterized by a tubular element which is intended to be mounted on one of said parts co-axially with the axis of rotation between said parts, and a housing which is arranged to surround at least partially the tubular element and to be connected to the other of said parts, the signal transmission cables extending axially through the tubular element and being folded or deflected through 90° and extending out through an opening in the element and then being loosely wound helically for a number of turns around the outside of the tubular element, whereafter the cables extend out through an opening in the surrounding housing and are again folded through about 90° so as to extend substantially along the outside of the housing, said cables being folded through about 90° and extend out through the opening in the tubular element at locations axially spaced therealong, said cables being loosely wound helically outside the tubular element in opposite winding directions.

4,812,133

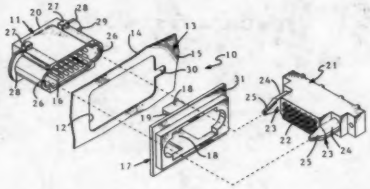
FLOATING MOUNTING MEANS FOR ELECTRICAL CONNECTOR ASSEMBLY

David S. Fleak, Palmyra; William H. Rose, Harrisburg, and Attalee S. Taylor, Palmyra, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 30, 1988, Ser. No. 213,557

Int. Cl.[4] H01R *13/74*

U.S. Cl. 439—248 **17 Claims**



12. An electrical apparatus, comprising:

a power supply having a floating receptacle which floats relative to the power supply and is provided with a plurality of contacts;

an electrical assembly adapted to be energized by the power supply and having a plug connector provided with a plurality of complementary contacts adapted to engage the contacts on the floating receptacle; and

a retainer releasably engaging the receptacle externally of the power supply, such that the retainer may be released from the receptacle only from the interior of the power supply, the receptacle extending beyond the retainer outwardly of the power supply for slidably receiving the plug connector, whereby the floating receptacle and the contacts carried thereby accommodate tolerance accumulations between the power supply and the electrical assembly, respectively, and facilitate an angular movement therebetween.

4,812,134

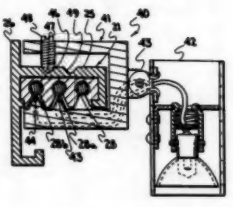
WALL MOUNTED LIGHTING TRACK SYSTEM

Ruth E. Miller, and Jack V. Miller, both of 700 N. Auburn Ave., Sierra Madre, Calif. 91024

Filed May 23, 1988, Ser. No. 198,094

Int. Cl.[4] H01R *13/60*

U.S. Cl. 439—110 **13 Claims**



1. A lighting track system for mounting to a vertical wall including:

an elongated channel in the form of an inverted U with a horizontal web having an upper surface and connecting first and second depending legs, the channel retaining one or more electrical conductors extending therethrough, connectable to a source of external power, insulated from each other and the channel and accessible for connection from the open side of the channel;

means for attaching the first vertical leg to a wall; and
means for making mechanical and electrical connection to the channel and conductors along the length of the track.

4,812,135

FLEXIBLE ELECTRICAL CONNECTORS

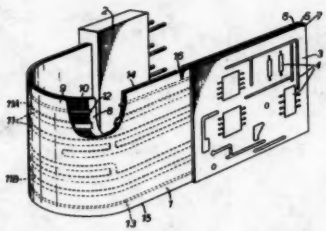
Arthur R. Smith, Lexden, England, assignor to The General Electric Company, p.l.c., London, England

Filed Jul. 25, 1985, Ser. No. 758,972

Claims priority, application United Kingdom, Jul. 26, 1984, 8419100

Int. Cl.[4] H01R *25/00*; H01B *7/08*

U.S. Cl. 439—493 **19 Claims**



1. In a flexible electrical connector comprising two layers of insulating material having a flat thin conductor, of the type formed by printed circuit and similar techniques, between them; the improvement comprising a flexible reinforcing thread which is secured along its length to at least one of said layers between at least one edge of the connector and the conductor track, which is of greater strength against tearing than the conductor, and which is sufficiently flexible so as not to impair the flexibility of the connector.

15. Apparatus including a rigid member having electrical circuitry connected to other electrical circuitry by a flexible electrical connector which comprises two layers of insulating material having a flat thin conductor, of the type formed by printed circuit and similar techniques, between them, and a flexible reinforcing thread secured along its length to at least one of said layers between at least one edge of the connector and the conductor, and said flexible reinforcing thread being of greater strength against tearing then the conductor, and being sufficiently flexible so as not to impair the flexibility of the connector.

4,812,136

ELECTRICAL PLUG AND SOCKET CONNECTOR

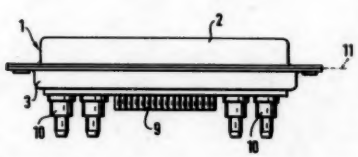
Paul-Rainer Molitor, Mühldorf/Inn, Fed. Rep. of Germany, assignor to Otto Dunkel GmbH, Fabrik fur Eletrotechnische Gerate, Mühldorf, Fed. Rep. of Germany

Filed Apr. 22, 1988, Ser. No. 184,890

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1987, 3714552

Int. Cl.[4] H01R *13/40*

U.S. Cl. 439—589 **3 Claims**



1. An electrical plug and socket connector, comprising:
an elongated metal connector frame **(1)** adapted to be affixed to an apparatus housing or the like, the connector frame including a frame front part **(2)** and a frame rear part **(3)**;
a two-piece insulating body **(4, 5)** fabricated of insulating materials and enclosed between the frame front and rear parts, said insulating body having a plurality of bores therein for accommodating a plurality of contact elements **(6, 7)** in the form of plug pins, plug sockets, or the like which elements become enclosed in and insulated by the insulating materials of the said insulating body, said contact elements **(6, 7)** being connectable to electrical conductors at a rear side of the connector, and at a front side of the connector said contact elements **(6, 7)** being engagable with mating contact elements of a corresponding multiconductor socket, plug or like member which are connected to a connecting cable, wherein the insulating body includes a front supporting and guiding plate **(4)** fabricated of thermoplastic plastic and having bores therein to accommodate frontward regions of the contact elements **(6, 7)**, and a rear plate **(5)** with corresponding bores for rearward regions of the contact elements;
the rear plate of the insulating body being in the form of a sealing plate **(5)** of rubberlike elastic material, said sealing plate **(5)** being so dimensioned with respect to the face of said supporting and guiding plate **(4)** which face is directed toward it, and which supporting and guiding plate rests against an outwardly curved flange **(12)** of the front part of the frame, that after the two frame parts **(2, 3)** are fastened together an edge region **(13)** of said sealing plate which faces away from the supporting and guiding plate **(4)** is held in compression against a supporting edge region **(14)** of the rear frame part **(3)**, so as to furnish a seal therewith;
and wherein the bores passing through the sealing plate **(5)** are configured to have therein ring-shaped grooves with supporting-shoulders **(17, 18)** for engaging ring-shaped collars **(15, 16)** on the contact elements which collars project radially outward and fix the position of the contact elements **(6, 7)** when said contact elements are pushed into the connector assembly.

4,812,137

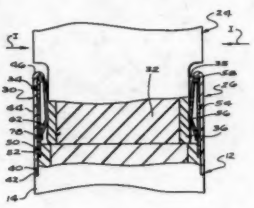
CONNECTOR WITH EMI/RFI GROUNDING SPRING

Albert H. Wilson, Los Angeles, and David E. Welsh, Tustin, both of Calif., assignors to ITT Corporation, New York, N.Y.

Filed Nov. 25, 1987, Ser. No. 125,273

Int. Cl.[4] H01R *9/00, 13/658*

U.S. Cl. 439—607 **8 Claims**



1. A connector comprising:
connector shell having a forward end;
an insulative body within said shell;
a plurality of contacts mounted in said body and having forward ends at said forward shell end;
a hood mounted on said shell and extending forwardly therefrom, said hood having an inside closest to said contacts and an outside;
an interference shield having an outer portion lying against said inside of said connector hood and having an inner portion for making wiping contact with the shell of another connector;

said connector hood having a rearward end mounted on said shell, said hood extending forwardly therefrom and then inwardly in a loop to form a looped forward hood end;

said shield having a looped front end lying rearward of said looped hood forward end and connecting said shield inner and outer portions, said shield inner portion having a front part extending rearwardly and inwardly from said shield looped forward end and forming a contact region, and including a rear part extending rearwardly and outwardly from said contact region.

4,812,138

CONNECTOR TERMINAL

Hiroki Kondo; Hiroaki Saito; Makoto Katsumata, and Michitaka Kinoshita, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

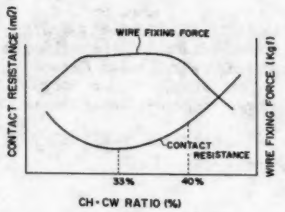
Filed Dec. 23, 1987, Ser. No. 137,199

Claims priority, application Japan, Feb. 12, 1987, 62-283553

Int. Cl.[4] H01R *4/18*

U.S. Cl. 439—865 **6 Claims**

1. A connector terminal comprising a base plate having an electrical contact portion at one side and an electrical wire connecting portion at the other side, and a pair of wire barrel members initially extending upwardly from both edges of said base plate, a conductor of an electrical wire being subsequently crimped by said pair of wire barrel members, wherein a CH.CW ratio of an electrical wire pressure contact portion formed by said base plate and said wire barrel members after



crimping is in the range of 31 to 35%, said CH.CW ratio being defined by the following equation:

$$CH \cdot CW \text{ ratio} = \frac{CH}{CH + CW} \times 100(\%),$$

where CH is the crimp height and CW is the crimp width.

4,812,139

DYED POLYESTER FABRICS WITH IMPROVED LIGHTFASTNESS

George L. Brodmann, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed May 4, 1988, Ser. No. 190,164
Int. Cl.[4] D06P *5/02*
U.S. Cl. 8—490 17 Claims

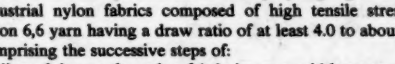
1. A process for protecting dyed polyester fabrics from photodegradation of the dye and slight to severe color changes in dyed synthetic fabrics, comprising applying to a dyed polyester fabric a photodegradation- and light-stabilizing amount of a combination of at least one organic solvent-soluble UV absorber and at least one organic solvent-soluble hindered amine light stabilizer, the resulting protected fabric having a lightfastness rating of between about 4 and about 5 for up to 100 hours in a WeatherOmeter exposure.

4,812,140

CONTINUOUS AQUEOUS DYEING PROCESS FOR HIGH-TENACITY INDUSTRIAL NYLON FABRICS

Ernest J. Russell, Greensboro, and M. K. Choi, Jamestown, both of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Jul. 15, 1987, Ser. No. 73,481
Int. Cl.[4] D06P *5/00*
U.S. Cl. 8—492 14 Claims



1. A continuous process for uniformly dyeing high-tenacity industrial nylon fabrics composed of high tensile strength nylon 6,6 yarn having a draw ratio of at least 4.0 to about 5.1 comprising the successive steps of:

(1) applying to the nylon fabric in open width an aqueous dyebath volatile at elevated temperatures containing a tinctorial amount of an acid dyestuff, a wetting agent and a dye transport system active at elevated temperatures and composed of (a) a retarding and leveling agent to facilitate rapid penetration of the nylon filament bundles and (b) a mono, di- or tri- lower (C_1–C_4) alkylene glycol having a molecular weight in the range of about 50 to about 200;

(2) drying the dyed fabric of step (1) to reduce migration of the dyebath liquid on the fiber, to heat activate the dye transport system and promote uniform penetration of the filament bundle;

(3) thermofixing the treated fabric of step (2) at elevated temperatures in the range of about 375° to about 425° F. to penetrate the dyestuff into the fibers and to volatilize the aqueous dyebath then

(4) enhancing dye penetration by exposing the fabric to a wetting agent and a nylon swelling agent, to swell the nylon fibers and further penetrate the dyestuff into the nylon fibers;

(5) subjecting the fabric to saturated steam maintained at a temperature in excess of 200° F. for a period of time sufficient to completely fix the dyestuff in the fabric; and thereafter

(6) washing the fabric to remove any unattached dye and any remaining processing agents.

4,812,141

COLORED THERMOPLASTIC RESIN COMPOSITION

Alan S. Baumgartner; Patrick D. Moore, and Richard A. VanDahm, all of Spartanburg, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Continuation-in-part of Ser. No. 877,056, Jun. 23, 1986, Pat. No. 4,732,570, which is a division of Ser. No. 775,614, Sep. 13, 1985, Pat. No. 4,640,690. This application Mar. 17, 1988, Ser. No. 169,568
Int. Cl.[4] D06P *3/00, 5/13, 3/79, 3/24*
U.S. Cl. 8—506 17 Claims

1. A colored thermoplastic resin composition which comprises a thermoplastic resin and a colorant in the form of a polyalkyleneoxy-substituted chromophore group incorporated into said thermoplastic resin in a minor amount sufficient to provide coloration, while said thermoplastic resin is dissolved in a solvent so as to distribute said colorant throughout the mass of said thermoplastic resin and thereafter said solvent is evaporated so that said colorant is essentially non-extractable from said resin.

4,812,142

COLORED POLYCARBONATE ARTICLES WITH HIGH IMPACT RESISTANCE

George L. Brodmann, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Dec. 1, 1987, Ser. No. 127,086
Int. Cl.[4] D06P *3/52*
U.S. Cl. 8—512 11 Claims

1. A process of dyeing a shaped polycarbonate article comprising the steps of:

(1) immersing a polycarbonate article in a dyeing medium composed of a organic solvent having a boiling point of at least 350° F. containing a tinctorial amount of at least one dye dissolved therein selected from the group consisting of crude nonionic dyes, solvent nonionic dyes and premetalized dyes and maintaining the solution at a temperature of at least 200° F. while retaining the article in the solution for a period of time sufficient to allow a predetermined level of the dye to penetrate into and dye the polycarbonate article without substantially reducing the impact strength of the article;

(2) removing the article from the solution and rinsing the article with a solvent for the dyeing medium to remove any unfixed dye from the article; and

(3) drying the thus-dyed article to produce a uniformly dyed polycarbonate article.

4,812,143

LIQUID FORMULATIONS OF DISPERSE DYESTUFFS CONTAINING INORGANIC OXIDES OR SILICATES FOR DYEING TEXTILE MATERIALS

Klaus Hofmann, Frankfurt am Main; Ulrich Bühler, Alzenau, and Erwin Dietz, Kelkheim, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 7, 1987, Ser. No. 129,248
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643864
Int. Cl.[4] C09B *67/40;* D06P *1/67*
U.S. Cl. 8—528 7 Claims

1. In a disperse dyestuff paste having a dyestuff content of up to 50% by weight the improvement comprises said dough containing 0.1 to 10% by weight of a pulverulent highly disperse inorganic oxide or silicate or a mixture thereof which has a BET specific surface area of 20 to 800 square meters per gram.

4,812,144

FLAME-RESISTANT NYLON/COTTON FABRIC AND PROCESS FOR PRODUCTION THEREOF

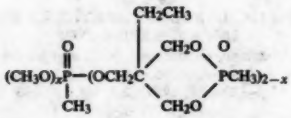
John H. Hansen, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Jul. 7, 1987, Ser. No. 70,559
Int. Cl.[4] C09B 67/00
U.S. Cl. 8—584 8 Claims

1. A process for imparting flame resistance to nylon/cotton blend fabric containing at least 40% by weight nylon, comprising the successive steps of:

(1) applying to the fabric a flame-retarding amount of a prepolymer condensate of urea and a tetrakis(hydroxymethyl)phosphonium salt flame retardant that fixes to the cotton fibers, drying the fabric to at most about 20% by weight of moisture, exposing the prepolymer condensate-containing fabric to a source of ammonia to form a flame-retardant polymer network within the cotton fiber structure, then oxidizing the fabric to further improve flame resistance and enhance durability to multiple launderings, and then

(2) applying an additional flame-retarding amount of (i) a cyclic phosphonate ester represented by the formula:



in which x is 0 or 1, that fixes onto the nylon fibers in combination with (ii) a tetrakis(hydroxymethyl)phosphonium salt and urea to the fabric, heating the fabric to form an insoluble phosphorus-containing polymer in and on the cotton then oxidizing the fabric to further improve the flame resistance and enhance durability to multiple launderings, the thus-treated fabric having at least 2.4% phosphorus, as measured by ASTM D1091-54T, fixed to the fibers after 50 launderings,

steps (1) and (2) conducted in the order stated.

4,812,145

PROCESS FOR THE PRODUCTION OF A BATTERY SEPARATOR

Robert J. LaBonte, Rochester, N.H., assignor to Lydall, Inc., Manchester, Conn.

Division of Ser. No. 136,334, Dec. 22, 1987, Pat. No. 4,767,687.
This application Mar. 25, 1988, Ser. No. 173,538
Int. Cl.[4] H01M 2/14
U.S. Cl. 29—623.1 15 Claims

1. A process for the production of an alkaline dry cell battery separator being a laid mat of non-dissolvable polyvinyl alcohol fibers and cellulosic fibers held together by a matrix of dissolved dissolvable polyvinyl alcohol fibers comprising:

(a) mixing the said non-dissolvable polyvinyl alcohol fibers, dissolvable polyvinyl alcohol fibers and cellulosic fibers in a solvent liquid until a relatively uniform mixture of the cellulosic fibers in the said non-dissolvable fibers is achieved and the said dissolvable fibers are dissolved;

(b) forming a mat of the said fibers in the mixture; and

(c) drying the mat to a shape-sustaining form.

4,812,146

LIQUID FUELS OF HIGH OCTANE VALUES

Peter J. Jessup, Santa Ana, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Jun. 9, 1988, Ser. No. 204,624
Int. Cl.[4] C10L 1/18, 1/06
U.S. Cl. 44—77 83 Claims

1. An unleaded fuel composition havng an octane rating of about 100 or more, said fuel comprising toluene and alkylate and at least two further components selected from the group consisting of methyl tertiary-butyl ether, isopentane, and n-butane.

2. The fuel composition of claim 1 comprising the components shown in the following table in the concentration ranges indicated:

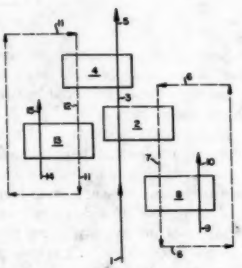
Toluene	46 to 60 vol. %
Isopentane	7 to 15 vol. %
Alkylate	15 to 35 vol. %
MTBE	5 to 10 vol. %

4,812,147

MULTICOMPONENT ADSORPTION PROCESS

William E. BeVier, Kenmore, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 8, 1985, Ser. No. 796,240
Int. Cl.[4] B01D 53/04
U.S. Cl. 55—25 26 Claims



1. A process for the removal by adsorption of more than one component from a gaseous stream comprising:

(a) passing a gaseous stream containing two components, a first component and a second component, wherein the first component is more strongly sorbed than the second component, in contact with a first mass of adsorbent to transfer the majority but not all of the first component to the first mass of adsorbent;

(b) passing the resulting gaseous stream in contact with a second mass of adsorbent, separate and spaced from the first mass of adsorbent, to transfer substantially all of the remaining first component and substantially all of the second component to the second mass of adsorbent;

(c) regenerating the second mass of adsorbent to a low residual loading with respect to the first component; and

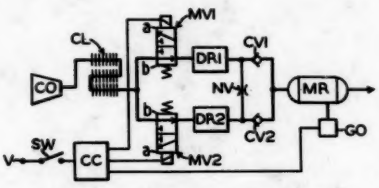
(d) regenerating the first mass of adsorbent to a high residual loading.

4,812,148

ARRANGEMENT FOR CONTROLLING THE REMOVAL OF MOISTURE FROM A TWO-CYLINDER TYPE MOISTURE REMOVER

Yasuhisa Hata, Akashi, and Masaaki Kitaue, Kobe, both of Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed Nov. 17, 1987, Ser. No. 121,433
Claims priority, application Japan, Nov. 21, 1986, 61-278993
Int. Cl.[4] B01D 53/04
U.S. Cl. 55—162 2 Claims



1. A system for controlling a two-cylinder type of moisture remover in which the drying time limit of the drying cylinders is preset; means for switching each of the drying cylinders to a drying and regenerating state at the preset time only when an air compressor continuously operates for a time longer than the preset time; means for maintaining each of the drying cylinders in the condition it was in just prior to the stopping of the air compressor; means for causing both of the drying cylinders to assume the drying state or the regenerating state together when the outlet pressure decreases to a certain pressure after the air compressor has stopped and when a predetermined length of time has passed after stoppage of the air compressor; means for causing the drying cylinders to be switched to a state opposite that of previous operation when the air compressor is again placed in operation; means for feeding moist air from the air compressor from the inlet to the outlet direction of the one drying cylinder to the other drying cylinder; each of the drying cylinders includes absorbent; means for causing a portion of the dried air of one drying cylinder to circulate in counterflow from the outlet to the inlet direction to regenerate the absorbent in the other drying cylinder; and means for alternately repeating the drying and regeneration states of the drying cylinders

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4,812,149

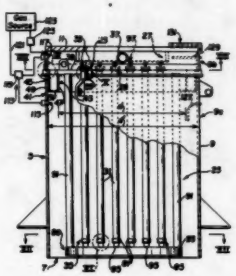
HOT INERT GAS PURGING FOR FILTER BLOWBACK PROCESS

Rodney L. Griffin, Roy, Utah; David F. Ciliberti, and Thomas E. Lippert, both of Murrysville Boro, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 3, 1987, Ser. No. 128,310
Int. Cl.[4] B01D 39/20
U.S. Cl. 55—71 15 Claims

1. In a process for filtering particulate materials from a hot gas stream of the type which contain gaseous constituents that have a condensation temperature and are subject to condensation or solids formation during separation of the particulate material through cooling of the gas stream, and in which ceramic filter and blowback gas ports and blowback conduits are utilized for cleaning said filter, and in which a purge gas flow which continually exits through the blowback gas ports is utilized; the improved method which comprises:

preheating said purge gas flow to above the condensation temperature of said component of the gas stream which component is subject to condensation or solids formation during the separation of the particulate material through cooling of the gas stream, whereby condensation in the



blowback gas ports and blowback conduits is substantially avoided.

4,812,150

METALLIC-GLASS COATED OPTICAL FIBRES

Michael G. Scott, Littlebury, Great Britain, assignor to Standard Telephones and Cables, PLC, London, England

Continuation of Ser. No. 675,560, Nov. 28, 1984, abandoned. This application Feb. 24, 1987, Ser. No. 17,579
Claims priority, application United Kingdom, Dec. 6, 1983, 8332545
Int. Cl.[4] C03B 37/014
U.S. Cl. 65—3.11 7 Claims

1. A method of manufacturing a metallic glass coated optical fiber comprising the steps of applying a single layer of a metallic-glass-forming alloy to an optical fiber, the applied single layer being crystalline in form, and subsequently employing a laser beam to cause local melting of the single layer of metallic-glass-forming alloy, which local melting is carried out with the fiber moving rapidly through the laser beam so that the locally melted single layer cools sufficiently rapidly to produce a metallic glass coating on the fiber, the metallic glass coating being non-crystalline.

4,812,151

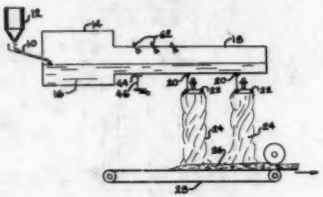
VISCOSITY CONTROL IN THE MANUFACTURE OF MINERAL FIBERS

Isac Sheinkop, Columbus, and Eugene C. Varrasso, Heath, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 8, 1988, Ser. No. 179,358
Int. Cl.[4] C03B 5/24
U.S. Cl. 65—29 7 Claims

1. A method for manufacturing mineral fibers comprising

feeding molten mineral material from a delivery means through a primary discharge bushing to a means for forming mineral fibers, forming mineral fibers from the molten mineral material, continuously discharging an auxiliary stream of molten mineral material from the delivery means through an auxiliary discharge outlet, continuously measuring the temperature and the mass flow rate of the auxiliary stream, calculating the viscosity of the molten mineral material using the measured temperature and the measured mass flow rate, and modifying a process parameter in response to the measured temperature of the auxiliary stream and the calculated viscosity of the stream.



4,812,152

DEVICE AND PROCESS FOR HEATING A FLAT OBJECT MADE OF THERMOPLASTIC MATERIAL ALONG A PREDETERMINED ZONE

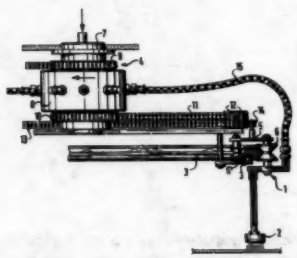
Karl-Heinz Juras, Mainz, Fed. Rep. of Germany, assignor to Schott Glaswerke, Fed. Rep. of Germany

Filed Sep. 23, 1987, Ser. No. 100,177

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1986, 3632408

Int. Cl.[4] C03B *29/00, 33/02*

U.S. Cl. 65—120 **16 Claims**



1. A process for heating an object of thermoplastic material in an elongated zone of predetermined contour, said process comprising:

providing a closed guidepath extending in correspondence with and in the vicinity of said elongated zone;

moving a plurality of burners in series along said guidepath synchronously, so as to heat said zone homogeneously, and

supplying said burners with fuel from a fuel distribution station moved in relation to the movement of said burners.

10. A device for heating an object of thermoplastic material in an elongated zone of a predetermined contour, said device comprising:

a closed guidepath extending in correspondence with and in the vicinity of said elongated zone;

a plurality of burners movable synchronously in series along said guidepath, so as to heat said zone homogeneously; and

a fuel distribution station, said station including:

a stator,

a rotor operatively coupled to said stator, said rotor forming a fuel distribution chamber from which flexible hoses lead to said burners to conduct fuel from said fuel chamber to said burners,

a first gear for driving said rotor, and a second gear having a toothed belt.

4,812,153

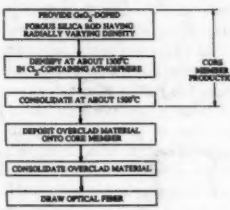
METHOD OF MAKING A GLASS BODY HAVING A GRADED REFRACTIVE INDEX PROFILE

Matthew J. Andrejco, Clinton, and John B. MacChesney, Lebanon, both of N.J., assignors to American Telephone and Telegraph Company, Murray Hill and AT&T Bell Laboratories & Bell Communications Research, Livingston, both of, N.J.

Filed Jan. 12, 1987, Ser. No. 2,731

Int. Cl.[4] C03C *25/02*

U.S. Cl. 65—3.12 **8 Claims**


PROVIDE GeO2-DOPED POROUS SILICA ROD HAVING RADIALLY VARYING DENSITY
DENSIFY AT ABOUT 1300°C IN Cl2-CONTAINING ATMOSPHERE
CONSOLIDATE AT ABOUT 1500°C
CORE MEMBER PRODUCTION
DEPOSIT OVERCLAD MATERIAL ONTO CORE MEMBER
CONSOLIDATE OVERCLAD MATERIAL
DRAW OPTICAL FIBER

1. Method of producing an optical fiber, the method comprising

(a) providing a porous body that comprises a dopant-containing region having a central portion and a peripheral portion, this dopant distribution in the porous body to be referred to as the initial dopant distribution;

(b) heating the porous body such that the porous body is consolidated into a glass body, to be referred to as the intermediate glass body, the intermediate glass body having a refractive index profile;

(c) making a preform by a process that comprises adding glass material to the intermediate glass body; and

(d) drawing an optical fiber from the preform;

wherein

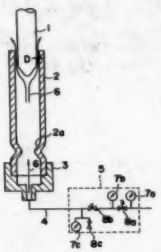
(e) the porous body has, during at least part of step (b), a radially non-uniform porosity and consequently a radially non-uniform density, with the density in the central portion of the dopant-containing region being higher than in the peripheral portion thereof; and wherein

(f) step (b) further comprises heating the porous body to a temperature and for a time such that substantial densification of the porous body occurs, the porous body being contacted during at least part of this time with a halogen-containing atmosphere such that a part of the dopant is removed from the porous body such that a dopant distribution results that differs substantially from the initial dopant distribution, such that the refractive index profile in the intermediate glass body is a substantially Gaussian profile.

4,812,154
METHOD FOR PRODUCING GLASS PREFORM FOR OPTICAL FIBER

Kiminobu Yoshida; Akio Shiomi, and Kazuhisa Watanabe, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Oct. 13, 1987, Ser. No. 106,602
Claims priority, application Japan, Oct. 15, 1986, 61-243271
Int. Cl.[4] C03B *37/012*
U.S. Cl. 65—3.11 5 Claims



1. A method for producing a glass preform for an optical fiber which comprises the steps of:

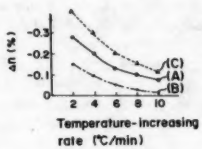
inserting a glass rod from one end of a glass tube into the tube while supplying a gas from the other end of the glass tube, flowing the gas through a clearance between the glass rod and the glass tube, exhausting the gas from said one end of the glass tube to outside of the glass tube so that the rod is centered within the tube via (a) the flowing gas and (b) a conically shaped end of the rod sliding into a mating relation with a constriction in the tube, and

heating and collapsing the glass tube on the glass rod to integrate them and to form the glass preform wherein the rod forms a core part of the preform and the tube forms a cladding part of the preform.

4,812,155
METHOD FOR PRODUCTION OF GLASS PREFORM FOR OPTICAL FIBERS

Michihisa Kyoto; Naoki Yoshioka; Gotaro Tanaka; Hiroo Kanamori; Minoru Watanabe, all of Yokohama, and Motohiro Nakahara, Mito, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo and Sumitomo Electric Industries, Ltd., Osaka, both of, Japan

Continuation of Ser. No. 901,979, Sep. 2, 1986, abandoned, which is a continuation of Ser. No. 661,452, Oct. 16, 1984, abandoned. This application Dec. 10, 1987, Ser. No. 132,655
Claims priority, application Japan, Oct. 19, 1983, 58-194102; Oct. 19, 1983, 58-194103
Int. Cl.[4] C03P *37/014;* C03B *37/018*
U.S. Cl. 65—3.12 6 Claims



1. A method of producing a glass preform for optical fibers comprising the steps of:

providing a glass particulate soot mass consisting essentially of quartz in the shape of a preform suitable for producing an optical fiber;

first heating the glass soot particulate mass in a gas atmosphere containing at least a gas of a non-hydrogen containing fluorine-based compound and a gas of cholrine-based compound containing no fluorine to dope said glass particulate mass with fluorine to provide optical fiber preform cladding which has a predetermined lower refractive index than the optical fiber preform core said first heating being effected in a muffle tube made of pure quartz and having iron and copper impurities;

second heating the fluorine-doped glass particulate mass to produce a transparent glass preform for optical fibers in a muffle tube made of pure quartz; and

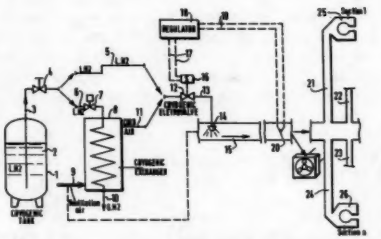
recovering said glass preform;

wherein in said first heating step (i) said non-hydrogen containing fluorine-based compound is present in an amount sufficient to incorporate fluorine into said glass particulate mass, and (ii) said chlorine-based compound containing no fluorine is present in an amount sufficient to prevent HF formation and to prevent incorporation of an impurity of iron and copper in the glass particulate mass and to thereby suppress light absorption by an impurity of iron and copper in said transparent glass preform wherein, to provide a predetermined desired relative refractive index difference between said cladding and said core by fluorine doping, said glass soot particulate mass is controllably heated during said first heating at a rate of 2° to 10° C./min. until the temperature of said glass soot particulate mass reaches a temperature of 1,100° to 1,400° C.

4,812,156
PROCESS FOR MANUFACTURING GLASS OBJECTS

Franck Virey, Paris, and Daniel Goumy, Saint Egreve, both of France, assignors to L'Air Liquide, Paris, France

Filed Dec. 17, 1987, Ser. No. 134,327
Claims priority, application France, Dec. 18, 1986, 86 17759
Int. Cl.[4] C03B *9/38*
U.S. Cl. 65—83 29 Claims



1. A process for manufacturing glass objects comprising cyclically feeding a plurality of moulds in succession with parison elements of glass in a viscous liquid state, shaping and then discharging the shape parison elements from the moulds, feeding ventilating air to said moulds to cool said moulds, measuring the temperature of said air, comparing the measured temperature with a set temperature, and, when the measured temperature is higher than the set temperature, causing injection and intimate mixing of a cold fluid directly into said ventilating air so as to maintain substantially constant, at least during predetermined periods of time, the temperature of the air on the moulds irrespective of the ambient temperature, wherein said cold fluid has a temperature substantially less than the ambient temperature.

24. A process for manufacturing glass objects comprising cyclically feeding a plurality of moulds in succession with parison elements of glass in a viscous liquid state, shaping and then discharging the shaped parison elements from the moulds,

feeding ventilating air to said moulds to cool said moulds, cooling the ventilating air between substantially an instant when a shaped parison element is discharged from the mould and an instant when a following parison element enters the mould, while maintaining the temperature of the ventilating air substantially constant during the instant when the following parison element enters the mould and the instant when said following element has been shaped and is discharged from the mould.

4,812,157

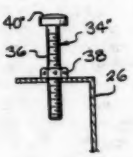
APPARATUS FOR FORMING GLASS SHEETS

Quintin R. Smith, 317 E. Fourth St., Port Clinton, Ohio 43452

Filed Nov. 5, 1987, Ser. No. 116,873

Int. Cl.[4] C03B *23/02*

U.S. Cl. 65—273 **20 Claims**



1. An adjustable glass forming apparatus comprising, in combination,

a frame conforming substantially to the shape of a glass panel, said frame including means for receiving a plurality of supports,

means for positioning said frame in a substantially horizontal orientation,

a plurality of free standing adjustable supports disposed about said frame in said support receiving means, each of said supports including a surface for supporting an edge adjacent region of said glass panel and means disposed between said support receiving means and said surface for adjusting the vertical position of said surface to adjust the supported height of said edge adjacent region of said glass panel.

4,812,158

CAKING-PREVENTING AGENT FOR FERTILIZER

Tetsuji Iwasaki, and Hitoshi Hosokawa, both of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 947,810, Dec. 30, 1986, abandoned. This application Aug. 11, 1988, Ser. No. 231,609

Claims priority, application Japan, May 21, 1986, 61-116719

Int. Cl.[4] C05G *3/00*; C05C *9/00, 13/00*

U.S. Cl. 71—64.12 **10 Claims**

1. A caking-preventing fertilizer composition comprising an aqueous solution obtained by solubilizing a substantially water-insoluble synthetic polymeric compound dissolved in a concentrated aqueous solution of a solubilizing agent, said solubilizing agent being a salt of an alkyl sulfate having 6 to 10 carbon atoms, an α-olefin sulfcnate having 6 to 10 carbon atoms or an alkylbenzene sulfonate having an alkyl group having 4 to 8 carbon atoms, wherein the ratio of said solubilizing agent to said water-insoluble synthetic compound is in the range of 1/9 to 9/1, and 1.0 to 50 percent by weight of a wet spread sticking agent based on the weight of said polymeric compound; and a fertilizer.

4,812,159

PLANT GROWTH REGULATORS DERIVED FROM CHITIN

Donald E. Freepons, 535 N. Montana, Kennewick, Wash. 99336

Continuation-in-part of Ser. No. 846,064, Mar. 31, 1986, abandoned. This application Mar. 13, 1987, Ser. No. 25,586

Int. Cl.[4] C05F *1/00*; C05G *3/00*

U.S. Cl. 71—16 **43 Claims**

1. A process for regulating plant growth comprising:

dissolving chitosan in glutamic acid to produce an aqueous solution comprising 0.1% by volume to 10% by volume chitosan and 0.1% by volume to 10% by volume of glutamic acid, and

distributing said aqueous solution in soil in which plants will be grown, in the seed planting zone.

4,812,160

CYCLOHEXENONE DERIVATIVES, PREPARATION AND USE THEREOF AS HERBICIDES

Dieter Jahn, Edingen-Neckarhausen; Michael Keil, Freinsheim; Dieter Kolassa, Ludwigshafen; Ulrich Schirmer, Heidelberg; Bruno Wuerzer, Otterstadt; Norbert Meyer, Ladenburg; Johann Jung, and Wilhelm Rademacher, both of Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

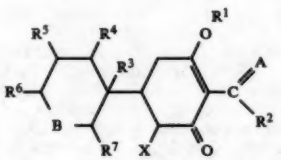
Filed Dec. 24, 1986, Ser. No. 946,060

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1986, 3600642

Int. Cl.[4] A01N *43/16*; C07D *309/02, 311/02*

U.S. Cl. 71—88 **6 Claims**

4. A herbicide containing an inert additive and an effective amount of a compound of the formula



(I)

where

A is oxygen or NOR^8, where R^8 is alkyl of 1 to 4 carbon atoms, alkenyl of 3 or 4 carbon atoms, alkynyl of 3 or 4 carbon atoms, haloalkyl or haloalkenyl of 2 to 4 carbon atoms and 1 to 3 halogen atoms, chlorothienyl or alkoxyalkyl of 2 to 4 carbon atoms,

B is 0,

X is hydrogen or methoxycarbonyl,

R^1 is hydrogen, carbonylalkyl of 2 to 18 carbon atoms or benzoyl or an inorganic or organic cation,

R^2 is alkyl of up to 4 carbon atoms,

R^3 and R^4, independently of each other, are each hydroxyl, chlorine, bromine, thioalkylcarboxyl, thiocarbonylalkyl, alkylcarbonyloxy each of up to 4 carbon atoms or R^3 and R^4 are together alkoxy of up to 3 carbon atoms and hydroxyl or together alkylthio of up to 3 carbon atoms and hydroxyl or together form an epoxy group,

R^5 and R^6, independently of each other, are each hydrogen or methyl or R^5 and R^6 together form a methyleneoxyethylene group, and

R^7 is hydrogen or methyl.

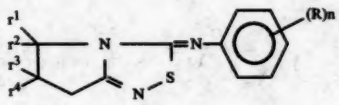
4,812,161

THIA (OXA) DIAZOLE DERIVATIVES

Kenji Hagiwara; Hisao Ishikawa, both of Odawara; Hideo Hosaka, Kanagawa, and Hideo Inaba, Shizuoka, all of Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan

Filed Jul. 29, 1985, Ser. No. 760,158
Claims priority, application Japan, Aug. 8, 1984, 59-164855; Jan. 10, 1985, 60-1446
Int. Cl.[4] A01N *43/82*; C07D *285/14, 251/24, 401/04*
U.S. Cl. 71—90 3 Claims

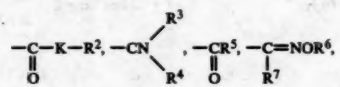
1. A compound having the formula



wherein

each of r^1, r^2, r^3 and R^4 represents hydrogen, C_{1-4} alkyl which may be substituted by C_{1-3} alkoxy, phenyl or methylthio, or phenyl which may be substituted by halogen or methyl, and such r^1, r^2, r^3 and r^4 may form alkylidene, and at least two of r^1, r^2, r^3 and r^4 are hydrogen; and

R represents same or different substituent(s) selected from the group consisting of halogen, nitro, cyano, —G—R^1,



dimethyl sulfamoyl and —L; and

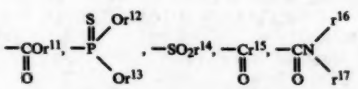
n represents an integer of 1 to 5; and

wherein

G represents —O—, —S—,

in which r^{10} represents hydrogen or C_{2-3} alkynyl; and

R^1 represents hydrogen,



quinoxalinyl which may be substituted by halogen, thiadiazolyl which may be substituted by methyl, pyridyl, 1,3,5-triazinyl, which may be substituted by halogen or methylamino, thiazolyl, tetrahydropyranyl, or

—T; and

K represents oxygen or sulfur; and

R^2 represents hydrogen, metal corresponding to one valency, C_{1-3} alkylidene amino or —U; and

each of R^3 and R^4 represents hydrogen, C_{1-3} alkyl, C_{2-3} alkynyl or C_{1-2} alkoxy; and

R^5 represents phenyl or C_{1-3} alkyl which may be substituted by methoxy; and

R^6 represents hydrogen, or C_{1-2} alkyl, which may be substituted by C_{1-2} alkoxycarbonyl; and

R^7 represents hydrogen or methyl; and

—L represents phenyl which may be substituted by methyl, C_{2-3} alkenyl which may be substituted by

C_{2-5} alkynyl, or C_{1-3} alkyl which may be substituted by halogen, hydroxy, cyano,

methoxy, acetyloxy or

and

wherein

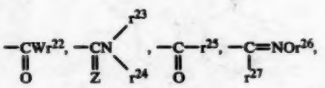
r^{11} represents methyl; and

each of r^{12} and r^{13} represents C_{1-2} alkyl; and

r^{14} represents C_{1-3} alkyl or phenyl which may be substituted by methyl; and

r^{15} represents C_{1-3} alkyl which may be substituted by halogen or

C_{1-2} alkoxycarbonyl or phenyl which may be substituted by halogen; and each of r^{16} and r^{17} represents hydrogen or C_{1-2} alkyl; and —T represents C_{1-12} alkyl which may be substituted by halogen, C_{3-6} cycloalkyl (which may be substituted by halogen), cyano, phenyl (which may be substituted by halogen, nitro, cyano, methyl or methoxy), —Q—r^{21}, acethyloxy, trimethylsilyl,



—$(OC_2H_4)_2OCH_3$, —$(OC_2H_4)_3OCH_3$ isoxazolyl (which may be substituted by methyl), oxadiazolyl (which may be substituted by C_{1-3} alkyl), pyrazolyl, or pyrydyl, C_{3-6} cycloalkyl which may be substituted by propargyl or halogen, C_{3-4} alkenyl which may be substituted by halogen or ethoxycarbonyl, C_{3-8} alkynyl which may be substituted by halogen or phenyl, or phenyl which may be substituted by halogen, trifluoromethyl or ethoxycarbonylethoxy; and

—U represents C_{1-8} alkyl which may be substituted by cyclopropyl, halocyclopropyl, cyano, C_{1-4} alkoxycarbonyl, methoxy, phenoxy, phenylthio, trimethylsilyl or —$O(CH_2)_{gh}$—Or^{28}, C_{2-4} alkenyl which may be substituted by C_{1-3} alkoxycarbonyl or propargyl which may be substituted by phenyl; and

r^{18} represents hydrogen, metal corresponding to one valency, C_{1-7} alkyl or propargyl; and

wherein

Q represents —O— or —$S(O)_k$—(k=0, 1 or 2); and

r^{21} represents hydrogen, C_{1-2} alkyl, which may be substituted by phenyl, methoxy or phenoxy, C_{1-2} alkoxycarbonyl, vinyl, phenyl which may be substituted by halogen, nitro, methoxy, methyl, trifluoromethyl or methylendioxy, naphthyl, pyrydyl which may be substituted by methyl or methylcarbamoyl; and

W represents oxygen or sulfur; and

r^{22} represents hydrogen, metal corresponding to one valency, C_{1-3} alkylidene amino, allyl, C_{3-5} alkynyl, phenyl or C_{1-10} alkyl which may be substituted by halogen, C_{1-3} alkoxy C_{2-3} alkenyloxy, benzyloxy, phenyl which may be substituted by methoxy, methylthio, phenoxy, allylthio, benzylthio or phenylthio, C_{1-2} alkoxycarbonyl, methox-

ycarbonylmethylthio, furyl, isoxazolyl which may be substituted by methyl, trimethylsilyl or cyano; and

Z represents oxygen or sulfur; and

each of r^{23} and r^{24} represents hydrogen, ethoxy, allyloxy, cyclohexylcarbamoyl, C_{1-4} alkyl radical which may be substituted by C_{1-2} alkoxy phenyl or C_{1-2} alkoxycarbonyl, allyl, propargyl, cyclohexyl or phenyl; and

r^{25} represents methyl, phenyl or morpholino; and r^{26} represents hydrogen, allyl or acetyl which may be substituted by halogen; and

r^{27} represents amino, methyl or phenyl; and

g represents an integer of 1 to 3; and

h represents an integer of 2 to 7; and

r^{28} represents methyl;

or a salt thereof with an organic or inorganic acid.

2. A herbicidal composition comprising an inert carrier and an effective amount of a compound of claim 1.

4,812,162

INDOLE DERIVATIVES AND THEIR USE AS FUNGICIDES, INSECTICIDES AND PESTICIDES

Vivienne M. Anthony, Maidenhead; John M. Clough, Marlow; Christopher R. A. Godfrey, Bracknell, and Paul J. de Fraine, Wokingham, all of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

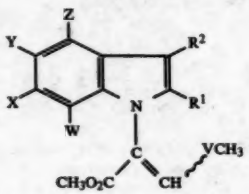
Filed Nov. 20, 1987, Ser. No. 123,212

Claims priority, application United Kingdom, Dec. 5, 1986, 8629169

Int. Cl.[4] A01N *43/10, 43/28, 43/38;* **C07D** *209/04, 401/06, 403/06;* **A61K** *31/38, 31/405*

U.S. Cl. 71—90 **9 Claims**

1. A compound of the formula (I):



(I)

or a stereoisomer thereof, wherein R^1 and R^2, which are the same or different are hydrogen, cyano, halogen or C_{1-6} alkyl; V is oxygen or sulphur; W, X, Y and Z, which may be the same or different, are hydrogen, halogen, nitro, cyano, C_{1-6} alkyl, C_{3-6} cycloalkyl, C_{3-6} cycloalkyl(C_{1-6})alkyl, phenyl(C_{1-4})alkyl, phenyl, phenoxy, C_{1-6} alkoxy, phenyl(C_{1-4})alkoxy, C_{2-6} alkenyl, C_{2-6} alkenyl subsituted with phenyl or an aromatic 5- or 6-membered heterocyclic ring containing at least one nitrogen, sulphur or oxygen heteroatom, $S(O)_nR^3$ (wherein n is 0, 1 or 2), or an aromatic 5- or 6-membered heterocyclic ring containing at least one nitrogen, sulphur or oxygen heteroatom, or W, X, or X, Y or Y, Z together form methylenedioxy; and R^3 is C_{1-6} alkyl, phenyl, phenyl(C_{1-4})alkyl or an aromatic 5- or 6-membered heterocyclic ring containing at least one nitrogen, sulphur or oxygen atom; wherein any of the foregoing alkyl, cycloalkyl, cycloalkylalkyl and alkoxy groups and the alkyl moieties of phenylalkyl and phenylalkoxy groups may be substituted with hydroxy, halogen, C_{1-4} alkoxy or C_{1-4} alkoxycarbonyl, and wherein any of the foregoing phenyl groups, the phenyl moieties of phenylalkyl, phenylalkoxy and phenoxy groups or heterocyclic rings may be substituted with halogen, hydroxy, C_{1-4} alkyl, trifluoromethyl, C_{1-4} alkoxy or trifluoromethoxy.

4. A fungicidal composition comprising as an active ingredient an effective amount of a compound according to claim 1 and a fungicidally acceptable diluent or carrier therefor.

4,812,163

PHENOXYACETIC ACIDS AND HERBICIDES COMPRISING THEM AS ACTIVE INGREDIENTS

Toshiyuki Hiramatsu; Shizuo Azuma; Koji Nakagawa, all of Iwakuni, and Yataro Ichikawa, Tokorozawa, all of Japan, assignors to Teijin, Limited, Osaka, Japan

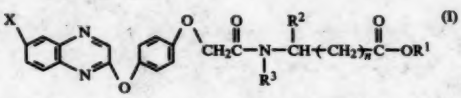
Continuation of Ser. No. 849,677, Apr. 9, 1986, abandoned. This application Mar. 18, 1988, Ser. No. 172,988

Claims priority, application Japan, Feb. 14, 1986, 61-29039

Int. Cl.[4] C07D *241/44, 403/12, 207/08;* **A01N** *43/60*

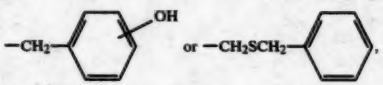
U.S. Cl. 71—92 **11 Claims**

1. A phenoxyacetic acid represented by the following formula (I)



(I)

wherein X represents a halogen atom, R^1 and R^3 are identical or different and each represents a hydrogen atom or an alkyl group having not more than 5 carbon atoms, R^2 represents a hydrogen atom, a lower alkyl group, a phenyl group, a benzyl group, $—CH_2CH_2SCH_3$, $—CH_2OH$, $—CH(CH_3)OH$, $—CH_2SH$, $—CH_2COOCH_3$,



or R^2 and R^3 together may form $—CH_2CH_2CH_2—$ or $—CH_2CH_2CH(OH)—$, and n is 0, 1 or 2, or a salt at the carboxyl group of the phenoxyacetic acid of the above formula in which R^1 is a hydrogen atom.

7. A herbicidal composition comprising a phenoxyacetic acid of formula (I) or its salt according to claim 1 as a herbicidally active ingredient, and a carrier therefor.

4,812,164

HERBICIDAL HETEROCYCLIC COMPOUNDS

Jean Wenger, Uster, and Paul Winternitz, Greifensee, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

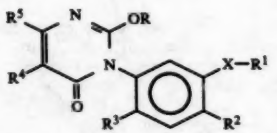
Filed Sep. 15, 1987, Ser. No. 96,432

Claims priority, application Switzerland, Sep. 18, 1986, 3741/86; Jul. 24, 1987, 2828/87

Int. Cl.[4] A01N *43/54;* **C07D** *239/54*

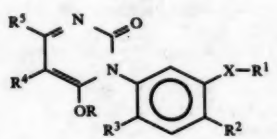
U.S. Cl. 71—92 **15 Claims**

1. A compound of the formula



Ia

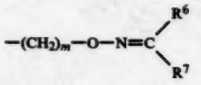
or



Ib

wherein

R is C_{1-4}-alkyl, or C_3 or 4-alkynyl,
R^1 is C_{1-8}-alkyl, C_{2-6}-alkenyl, C_{2-6}-alkynyl, C_{2-8}-alkoxyalkyl or a group



R^2 is halogen or cyano,
R^3 is halogen,
R^4 is hydrogen, fluorine or C_{1-4}-alkyl,
R^5 is C_{1-4} alkyl or C_{1-4}-haloalkyl, or
R^4 and R^5 together form tri- or tetramethylene,
R^6 is C_{1-4}-alkyl,
R^7 is C_{1-4}-alkyl,
m is 1 or 2 and
X is O, O-C(O), O-C(O)-O or C(O)-O.

12. A weed control composition which contains as an active ingredient an effective amount of a compound according to claim 1.

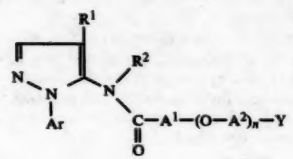
4,812,165

SUBSTITUTED 1-ARYLPYRAZOLES, COMPOSITIONS AND USE

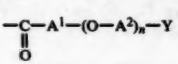
Otto Schallner, Monheim; Reinhold Gehring; Jörg Stetter, both of Wuppertal; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt; Klaus Lürssen, both of Bergisch-Gladbach, and Harry Strang, Düsseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 7, 1988, Ser. No. 164,673
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1987, 3707551
Int. Cl.[4] A01N *43/40, 43/56;* **C07D** *231/16, 401/04*
U.S. Cl. 71—92 **12 Claims**

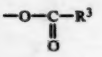
1. A substituted 1-arylpyrazole of the formula



in which
R^1 represents hydrogen or nitro,
R_2 represents hydrogen, straight-chain or branched alkyl having 1 to 12 carbon atoms or a radical,

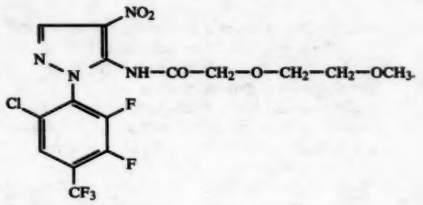


A^1 and A^2, independently of one another, in each case represent an in each case straight-chain or branched divalent alkylene radical having 1 to 6 carbon atoms,
Y represents halogen, hydroxyl, straight-chain or branched alkoxy having 1 to 6 carbon atoms which is optionally monosubstituted or polysubstituted by halogen, cyano or nitro, the substituents being identical or different, or optionally monosubstituted or polysubstituted phenyloxy, the subsitituents being identical or different and selected from the group consisting of halogen, cyano, nitro, in each case straight-chain or branched alkyl, alkoxy, alkylthio, halogenoalkyl, halogenoalkoxy, halogenoalkylthio or alkoxycarbonyl in each case having 1 to 4 carbon atoms and, if appropriate, 1 to 9 identical or different halogen atoms, or represents a



radical, where
R^3 represents hydrogen, amino, in each case straight-chain or branched alkyl, alkoxy, alkylamino or dialkylamino in each case having 1 to 6 carbon atoms in the individual alkyl parts, or in each case optionally monosubstituted or polysubstituted phenyl, phenoxy or phenylamino, the substituents being identical or different and selected from the group consisting of halogen, cyano, nitro, in each case straight-chain or branched alkyl, alkoxy, alkylthio, halogenoalkyl, halogenoalkoxy, halogenoalkylthio or alkoxycarbonyl in each case having 1 to 4 carbon atoms, and, if appropriate, 1 to 9 identical or different halogen atoms, represents in each case optionally monosubstituted or polysubstituted phenyl, 2-pyridyl, 3-pyridyl or 4-pyridyl, the substituents being identical or different and selected from the group consisting of halogen, cyano, nitro, in each case straight-chain or branched alkyl, alkoxy or alkoxycarbonyl, in each case having 1 to 4 carbon atoms in the alkyl parts, in each case straight-chain or branched halogenoalkyl or halogenalkoxy in each case having 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, or a $-S(O)_m-R^4$ radical where
R^4 represents amino, in each case straight-chain or branched alkyl, alkylamino, dialkylamino or halogenoalkyl, in each case having 1 to 4 carbon atoms in the individual alkyl parts and, in the case of halogenoalkyl having 1 to 9 identical or different halogen atoms, and
m represents a number 0, 1 or 2, and
n represents a number 1, 2, 3, or 4.

7. A compound according to claim 1, wherein such compound is 5-(2-methoxyethoxyacetamido)-4-nitro-1-(6-chloro-2,3-difluoro-4-trifluoromethylphenyl)-pyrazole of the formula



4,812,166

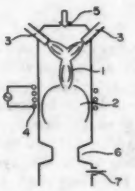
PROCESS FOR PRODUCING ULTRAFINE PARTICLES OF METALS, METAL COMPOUNDS AND CERAMICS AND APPARATUS USED THEREFOR

Goro Saiki; Jiro Kondo; Koichi Takeda, all of Kawasaki; Mutsuo Maki, and Tutomu Ooki, both of Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Japan

Filed Mar. 11, 1988, Ser. No. 166,942
Claims priority, application Japan, Mar. 11, 1987, 62-53985
Int. Cl.[4] B22F *9/08*
U.S. Cl. 75—0.5 C **6 Claims**

1. A process for producing ultrafine particles of a metal, a metallic compound or a ceramic having an average particle size of 0.05 to 1.0 μm which comprises
combining a plurality of direct current plasma currents on a central axis of a work coil for generating high frequency induction plasma,
supplying a metal, a metallic compound or a ceramic as a starting material to the combining portion of the direct current plasma currents while excluding the air,
vaporizing the starting material with heating,
leading the vaporized material to a temperature region hav-

ing a temperature equal to or higher than the melting point and lower than the boiling point of the starting material to



conduct condensation growth of liquid sphere of the starting material, followed by cooling.

4,812,167

PROCESS FOR RECOVERING METALLIC GALLIUM FROM GALLIUM COMPOUND-CONTAINING WASTE

Masayoshi Inooka, Yokohama, Japan, assignor to Chiyoda Corporation, Japan

Filed Apr. 18, 1988, Ser. No. 182,954

Claims priority, application Japan, Apr. 24, 1987, 62-102746; Apr. 24, 1987, 62-102747

Int. Cl.[4] C22B *7/00*

U.S. Cl. 75—63 **15 Claims**

1. A process for treating a waste containing a liquid, finely divided particles of a gallium compound and an organic substance capable of forming coke upon calcination for the recovery of the gallium valves as metallic gallium, comprising the steps of:

(a) heating said waste at a temperature of below about 400° C. in the atmosphere of an inert gas to remove said liquid and to cause the finely divided particles to aggregate, thereby to form a dried mixture;

(b) calcining said mixture at a temperature so that coke is formed by thermal decomposition of the organic substance and the finely divided particles are bound with each other with said coke serving as a binder;

(c) subjecting the calcined product obtained in step 5 (b) to vacuum thermal cracking to convert the gallium compound into molten metallic gallium; and

(d) recovering said molten metallic gallium.

4,812,168

PROCESS FOR CARBOTHERMIC PRODUCTION OF ALKALINE EARTH METAL ALUMINIDE AND RECOVERY OF SAME

C. Norman Cochran, Oakmont, Pa., and Melvin H. Brown, Morning Sun, Iowa, assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 24, 1986, Ser. No. 946,200

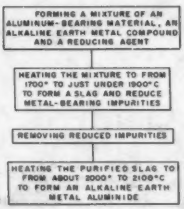
The portion of the term of this patent subsequent to Aug. 23, 2005, has been disclaimed.

Int. Cl.[4] C22B *21/04*

U.S. Cl. 75—68 A **19 Claims**

1. An improved process for carbothermically producing an alkaline earth metal aluminide from an aluminum-bearing material and an alkaline earth metal compound which comprises the steps of:

(a) forming a slag comprising said alkaline earth metal compound and said aluminum-bearing material; and


FORMING A MIXTURE OF AN ALUMINUM-BEARING MATERIAL, AN ALKALINE EARTH METAL COMPOUND AND A REDUCING AGENT
HEATING THE MIXTURE TO FROM 1700° TO JUST UNDER 1900°C TO FORM A SLAG AND REDUCE METAL-BEARING IMPURITIES
REMOVING REDUCED IMPURITIES
HEATING THE PURIFIED SLAG TO FROM ABOUT 2000° TO 2100°C TO FORM AN ALKALINE EARTH METAL ALUMINIDE

(b) reducing said slag with a reducing agent to form the corresponding alkaline earth metal aluminide.

4,812,169

PROCESS FOR PRODUCING A FIRE-RESISTANT, LIGHT-WEIGHT CONSTRUCTION MATERIAL

Sadaji Matsuura, Numazu; Yasuo Arai, Kunitachi; Shigeki Aoki, Tokyo, and Satoru Ando, Fuji, all of Japan, assignors to Fuji Fire-Proof Material Industry Co., Ltd., Shizuoka, Japan

Continuation of Ser. No. 773,535, Sep. 9, 1985, abandoned, which is a continuation of Ser. No. 574,261, Jan. 26, 1984, Pat. No. 4,586,958. This application Jun. 9, 1987, Ser. No. 60,939

Claims priority, application Japan, Jan. 26, 1983, 58-11058; Jan. 26, 1983, 58-11059

The portion of the term of this patent subsequent to May 6, 2003, has been disclaimed.

Int. Cl.[4] C09D *5/14*

U.S. Cl. 106—15.05 **17 Claims**

1. A process for producing a fire-resistant, light weight construction material which comprises:

subjecting fly ash to a swelling treatment with a mineral acid to prepare a slurry;

adding to the slurry a slurry hardener to form a mixture and kneading the mixture;

adding to the kneaded mixture about 20 to about 40 parts of a material selected from sand, fine gravel or a mixture thereof per 100 parts by weight of the slurry; and

shaping and hardening the sand and/or fine gravel containing kneaded mixture to obtain the fire-resistant, light weight construction material.

4,812,170

PROCESS FOR PRODUCING AN INORGANIC FOAM

John R. Humphries, Hayes, England, assignor to EMI Limited, Hayes, England

Continuation of Ser. No. 792,405, Oct. 29, 1985, Pat. No. 4,731,123. This application Aug. 27, 1987, Ser. No. 89,993

Claims priority, application United Kingdom, Nov. 3, 1984, 8427851

The portion of the term of this patent subsequent to Mar. 15, 2005, has been disclaimed.

Int. Cl.[4] C09D *1/00*; C04B *35/02*

U.S. Cl. 106—122 **8 Claims**

1. A process for producing a binding medium for an inorganic foam, said process comprising the steps of:

mixing a metallic compound, capable of decomposition to a metallic oxide by heating to a predetermined temperature, with an acid or acidic solution, which does not react substantially with said metallic compound but is capable of undergoing a reaction with said metallic oxide to form said binding medium, and

heating said mixture to said predetermined temperature to cause said decomposition of said metallic compound to said metallic oxide to occur to enable said reaction to be initiated,

said mixture thereby remaining in a substantially stable state until said heating is effected.

4,812,171

IRREVERSIBLE PHOTOCHROMIC MARKINGS

Jack Brettle, Greens Norton, and Clive Trundle, Silverstone, both of England, assignors to The Plessey Company, Essex, England

PCT No. PCT/GB87/00447, § 371 Date Apr. 7, 1988, § 102(e) Date Apr. 7, 1988, PCT Pub. No. WO88/00223, PCT Pub. Date Jan. 14, 1988

PCT Filed Jun. 25, 1987, Ser. No. 162,384

Claims priority, application United Kingdom, Jun. 27, 1986, 8615706

Int. Cl.[4] C09D *11/00*

U.S. Cl. 106—21 8 Claims

1. A photochromic ink composition which comprises a solution of a 1,2-dihydroquinoline (DHQ) in a polymer solution, the dihydroquinoline being sensitive or sensitised to ultraviolet light.

4,812,172

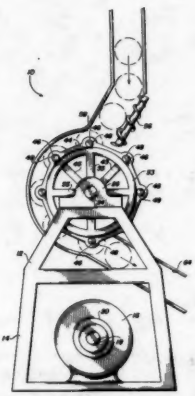
ROTARY APPARATUS AND METHOD FOR REMOVING TRIM RINGS FROM COMPOSITE CANS

James E. Brock, and William R. DeUnger, both of Orlando, Fla., assignors to Citrus Central, Inc., Orlando, Fla.

Filed Nov. 6, 1987, Ser. No. 117,339

Int. Cl.[4] B08B *9/04*

U.S. Cl. 134—22.1 14 Claims



1. Apparatus for removing foreign and undesirable materials from a plurality of open-ended lengths of hollow tubing, said apparatus comprising:

a rotatable drum having an axis of rotation;

means for rotating said drum;

means for feeding tubes across the periphery of said drum during rotation, with the axis of each tube generally parallel to the axis of rotation;

means for indexing said tubes in spaced relation about the periphery of said drum;

means for holding said tubes against the periphery of drum during a portion of each revolution of rotation of said drum; and

means extending into each tube while positioned on the periphery of said drum and during rotation for removing any foreign objects located in any tube, said removing means including a plurality of reciprocating plungers arranged alongside the periphery of said drum and generally parallel with said axis of rotation, and means for extending each of said plungers across the periphery of said drum and through one of said tubes, to remove any foreign objects therein.

4,812,173

STABILIZED HYDROGEN PEROXIDE CONTACT LENS DISINFECTING SOLUTION

Fu-Pao Tsao, Lawrenceville, and M. Alicja Sills, Norcross, both of Ga., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 1, 1987, Ser. No. 45,094

Int. Cl.[4] A61L *2/18*

U.S. Cl. 134—27 9 Claims

1. A method of disinfecting a polymeric contact lens comprising contacting said lens with a stabilized hydrogen peroxide solution, said solution having a pH of 5.5–8.0 and comprising a disinfectingly effective amount of hydrogen peroxide; a primary stabilizer which is 1,1-diphosphonic acid-ethanol in an amount of about 50 ppm to about 700 ppm based on the entire solution; a secondary stabilizer which is glycerin in an amount of about 50 ppm to about 1000 ppm based on the entire solution; and water.

4,812,174

METHOD FOR PROTECTING METALLIC SURFACES FROM CORROSION

Shiuji Kimura, 208-43 Musota, Wakayama, Japan, assignor to Teikoku Kako Co., Ltd., Osaka and Shiuji Kimura, Wakayama, both of, Japan

Continuation of Ser. No. 746,598, Jun. 19, 1985, abandoned. This application Aug. 31, 1987, Ser. No. 91,241

Claims priority, application Japan, Jun. 19, 1984, 127205

Int. Cl.[4] C23C *22/02*

U.S. Cl. 148—251 16 Claims

1. A method of preventing rust on a metallic substrate containing iron, zinc, or aluminum, said method comprising applying to said substrate a composition comprising: a condensate of tannic acid, a phenol and a ketone formed in the presence of an acid catalyst; and a coating component, said coating component selected from alkyd resins, aminoalkyd resins, guanamine resins, polyvinyl chloride resins, polyvinyl butyral resins, styrene-butadiene resins, chlorinated rubber, epoxy resins, acrylic resins, unsaturated polyester resins, polyurethane resins, silicon resins, titanium resins or mixtures thereof.

4,812,175

PASSIVATION PROCESS AND COPMPOSITION FOR ZINC-ALUMINUM ALLOYS

Gary A. Reghi, Sterling Heights, Mich., assignor to Parker Chemical Company, Madison Heights, Mich.

Continuation of Ser. No. 773,405, Sep. 6, 1985, abandoned. This application Jun. 10, 1987, Ser. No. 62,344

Int. Cl.[4] C23C *22/33*

U.S. Cl. 148—258 16 Claims

1. An aqueous, acidic, passivating solution for zinc and zinc-aluminum alloys, consisting essentially of:

(1) predominantly hexavalent, chromium ions present in about 2–20 p.grams/liter;

(2) phosphate ions present in about 1–15 p.grams/liter;

(3) nitrate ions present in about 0.5–6 p.grams/liter;

(4) optionally, fluroide ions, molybdate ions, tungstate ions, or a mixture thereof, present in an amount effective to accelerate the formation of said coating;

(5) hydrogen ions, present in an amount effective to afford an acid pH; and

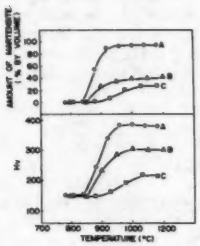
(6) water.

4,812,176

PROCESS FOR THE PRODUCTION OF A STRIP OF A CHROMIUM STAINLESS STEEL OF A DUPLEX STRUCTURE HAVING HIGH STRENGTH AND ELONGATION AS WELL AS REDUCED PLANE ANTISOTROPY

Teruo Tanaka; Katsuhisa Miyakusu, and Hiroshi Fujimoto, all of Yamaguchi, Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1987, Ser. No. 134,874
Claims priority, application Japan, Dec. 30, 1986, 61-311959; Dec. 30, 1986, 61-311960; Jan. 3, 1987, 62-100
Int. Cl.[4] C21D 8/02
U.S. Cl. 148—12 EA 11 Claims



6. A process for the production of a strip of a chromium stainless steel of a duplex structure, consisting essentially of ferrite and martensite, having high strength and elongation as well as reduced plane anisotropy and having a hardness of at least HV 200, which process comprises:

a step of hot rolling a slab of a steel to provide a hot rolled strip, said steel consisting essentially of, by weight,:

up to 0.10% of C,
up to 2.0% of Si,
up to 1.0% of Mn,
up to 0.040% of P,
up to 0.030% of S,
up to 0.60% of Ni,
from 10.0% to 14.0% of Cr,
up to 0.08% of N, the (C+N) being not less than 0.02% but not more than 0.12%,
up to 0.02% of O,
up to 0.20% of Al,
up to 0.0050% of B,
up to 2.5% of Mo,
up to 0.10% of REM, and
up to 0.20% of Y, the balance being Fe and unavoidable impurities;

at least two steps of cold rolling the hot rolled strip to provide a cold rolled strip of a desired thickness, including a step of intermediate annealing between the successive two cold rolling steps, said intermediate annealing comprising heating and maintaining the strip at a temperature to form a single phase of ferrite; and

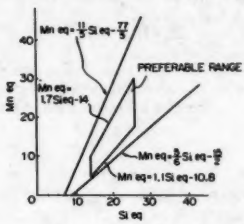
a step of continuous final heat treatment in which the cold rolled strip is continuously passed through a heating zone where it is heated to a temperature ranging from the Ac1 point of the steel to 1100° C. to form a two-phase of ferrite and austenite and maintained at that temperature for not longer than 10 minutes, and the heated strip is cooled at a cooling rate sufficient to transform the austenite to martensite.

4,812,177

HOT WORKING METHOD FOR PRODUCING A SUPERPLASTIC FERROUS DUPLEX-PHASE ALLOY

Yasuhiro Maehara, Kobe, and Yoshio Tarutani, Nishinomiya, both of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Division of Ser. No. 844,661, Mar. 27, 1986, Pat. No. 4,721,600.
This application Jan. 25, 1988, Ser. No. 147,530
Claims priority, application Japan, Mar. 28, 1985, 60-64163; Apr. 19, 1985, 60-84087
Int. Cl.[4] C21D 8/00
U.S. Cl. 148—12 EA 12 Claims



1. A superplastic hot working method for a duplex-phase stainless steel which consists essentially of, by weight,

C: at most 0.05%,
Si: 0–5.0%
Mn: 0–20.0%,
P: at most 0.05%,
S: at most 0.02%,
Cr: 10.0–35.0%,
Ni: 2.0–18.0%,
Mo: 0–6.0%,
N: 0.005–0.3%, and
one or more of W: 0–5.0%, Zr: 0–3.0%,
Nb: 0–3.0%, V: 0–5.0%, and Cu: 0–1.0%,
the balance being Fe and incidental impurities, wherein Si eq and Mn eq which are defined as

$$\text{Si eq}=\text{Si}+(2/3)\,(\text{Cr}+\text{Mo}),\text{ and}$$

$$\text{Mn eq}=\text{Mn}+2\text{Ni}+60\text{C}+50\text{N}$$

satisfy the formula

$$(5/6\,(\text{Si eq})-15/2 \leqq \text{Mn eq} \leqq (11/5)\,(\text{Si eq})-77/5,$$

said method comprising deforming the steel at a strain rate of from $1\times10^{-6}\ S^{-1}$ to $1\times10^{1}\ S^{-1}$ with the steel heated to a temperature of at least 700° C. and at most 100° C. below the temperature at which the steel transforms into a single ferrite phase in a non-oxidizing nitrogen gas atmosphere.

4,812,178

METHOD OF HEAT TREATMENT OF AL-BASED ALLOYS CONTAINING LI AND THE PRODUCT OBTAINED BY THE METHOD

Bruno Dubost, 3, rue Casimir Brenier, 38120 Saint Egreve, France

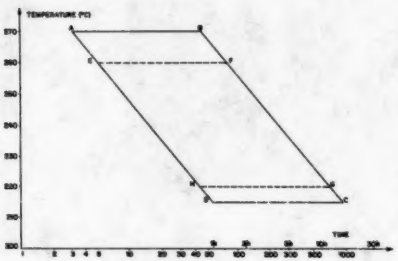
Filed Dec. 5, 1986, Ser. No. 938,510
Int. Cl.[4] C22F 1/04
U.S. Cl. 148—12.7 A 26 Claims

1. In a method of heat treatment of Al alloys containing Li and at least one principal element selected from the group consisting of Cu, Mg and Zn as well as optional minor elements comprising Zr, Mn, Ni, Hf, Ti and Be and optional impurities comprising Fe and Si, the balance being Al, said method comprising a solution treatment and a quenching operation, an optional plastic deformation and natural ageing operation followed by a least one ageing operation, the improvement

wherein said at least one ageing operation includes a principal ageing operation carried out in an area defined by a parallelogram, in a temperature-log-time diagram, whose corners have the following coordinates:

A 270° C.-3 min

B 270° C.-48 min



C 215° C.-16 hr

D 215° C.-1 hr

and is followed by a complementary ageing at a temperature lower than that of the principal ageing and which is between 165° and 215° C.

4,812,179

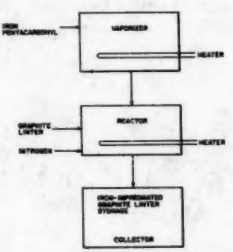
METHOD OF INCREASING THE BURNING RATE ENHANCEMENT BY MECHANICAL ACCELERATORS

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 10, 1984, Ser. No. 654,078

Int. Cl.[4] C06B *45/10*

U.S. Cl. 149—19.2 3 Claims



1. In a propellant composition comprising nitrocellulose, nitroglycerine, carboranylmethyl propionate, stabilizers, ammonium perchlorate, aluminum, and a mechanical burning rate accelerator selected from the group consisting of graphite linters and aluminum whiskers, the improvement in burning rate comprising substituting a substantially equal amount by weight of an impregnated mechanical burning rate accelerator for said mechanical burning rate accelerator, said impregnated mechanical burning rate accelerator being graphite linters or aluminum whiskers that have been modified to include a deposition on said graphite linters or said aluminum whiskers specks of metal selected from the group consisting of iron, vanadium, and palladium.

4,812,180

HIGH INTENSITY YELLOW SMOKE AND FLAME FLARE COMPOSITIONS

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 9, 1988, Ser. No. 245,237

Int. Cl.[4] C06B *45/10*

U.S. Cl. 149—19.5 5 Claims

1. A high intensity yellow smoke and flame composition comprising:

(i) a liquid, curable binder composition in an amount of about 15 weight percent wherein the prepolymer and curative of said liquid, curable binder composition is selected from the group consisting of a carboxyl-terminated polybutadiene prepolymer crosslinked with O,N,N-tri(2,3-epoxypropyl)-4-aminophenol, triethylene glycol succinate prepolymer crosslinked with O,N,N-tris(2,3-epoxypropyl)-4-aminophenol, and a hydroxylterminated polybutadiene prepolymer crosslinked with isophorone diisocyanate;

(ii) a first inorganic salt of lead iodide in an amount from about 60 weight percent to about 65 weight percent;

(iii) a second inorganic salt selected from the inorganic oxidizing salts consisting of potassium perchlorate in an amount from 0 to 25 weight percent and ammonium perchlorate in an amount from 0 to 20 weight percent, said second inorganic oxidizing salt being present as a single salt with the requirement that when one of said second inorganic oxidizing salt in weight percent is present the other of said inorganic oxidizing salt is 0 weight percent;

(iv) an optional magnesium metal in an amount from 0 to about 2 weight percent; and,

(v) an optional additive of a reactive source of iodine selected from iodine pentoxide and iodoform, said optional additive of a reactive source of iodine being employed to produce more intense yellow smoke as compared with a high intensity yellow smoke and flame composition containing only said first inorganic salt of lead iodide as the sole source of iodine.

4,812,181

METHOD OF ACHIEVING A FLAT MAGNETIZATION LOOP IN AMORPHOUS CORES BY HEAT TREATMENT

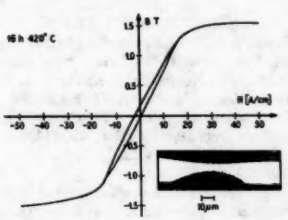
Hans-Rainer Hilzinger, Langenselbold, and Giselher Herzer, Hanau, both of Fed. Rep. of Germany, assignors to Vacuumschmelze GmbH, Fed. Rep. of Germany

Filed Mar. 16, 1987, Ser. No. 26,012

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1986, 3610527

Int. Cl.[4] H01F *1/00*

U.S. Cl. 148—121 3 Claims



1. A method for achieving a flat magnetization loop in a core wound of amorphous ribbon adaptable for use in a inductive component, said method comprising the steps of:

subjecting said core to a long-term heat treatment of more than 10 hours at a temperature greater than 410° C. and so far below the crystallization temperature of said amor-

phous ribbon to produce crystalline precipitation predominantly at a surface of said ribbon; and

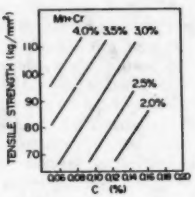
selecting the temperature during said heat treatment so low such that less than half of the ribbon cross-section exhibits crystalline precipitations at the conclusion of the treatment.

4,812,182

AIR-COOLING LOW-CARBON BAINITIC STEEL

Hongsheng Fang; Rufa Zhao; Yankang Zheng; Ziuyun Chen, all of Qinghua University, Beijing; Guangchu He, Second Automobile Factory, Shiyen, Hubei; Jiaoyou Gu, Second Automobile Factory, Shiyen, Hubei; Mingang Zhu, Second Automobile Factory, Shiyen, Hubei; Zhixin Zhang, and Keging Tong, both of Panzhihua Iron & Steel Co., Douko, Sichuan, all of China

Filed Jul. 31, 1987, Ser. No. 83,130
Int. Cl.[4] C22C *38/14*
U.S. Cl. 148—330 **11 Claims**



1. A forged steel article in the form of an elongated bar having a maximum cross-section dimension in a plane normal to the length of the bar at least about 30 mm. and having a principally granular bainite microstructure and a Brinell hardness of at least 220 and up to 350 upon air cooling the article to room temperature after hot working from a finishing temperature in the range from 850 deg. C. to 1050 deg. C. and wherein the steel consists essentially, by weight percent, of:

carbon 0.08 to 0.25%,
silicon 0.30 to 1.50%,
manganese 2.0 to 3.2%,
boron 0.0005 to 0.005%,
vanadium up to 0.10%,
titanium up to 0.04%,
sulfur up to 0.20%,
calcium up to 0.10%,
aluminum up to 0.025%,
chromium up to 1.5%, and
iron balance, except for incidental steelmaking impurities.

4,812,183

COATED SHEET STOCK

Robert E. Sanders, Jr., New Kensington, Pa.; Henry W. Kaanta, Newburgh, Ind.; John K. McBride, New Kensington, Pa.; Milton W. Milner, Newburgh, Ind.; Terry A. Perigo, Boonville, Ind., and Samuel L. Shelby, Newburgh, Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

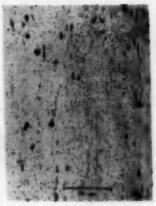
Filed Dec. 30, 1985, Ser. No. 814,461
Int. Cl.[4] C22F *1/047*
U.S. Cl. 148—439 **14 Claims**

13. An improved aluminum alloy coated sheet stock for fabricating into easy open ends for beverage containers resulting from the steps of:

(a) providing a body of an aluminum base alloy consisting essentially of, by weight, 4.0 to 5.5% Mg, 0.2 to 0.7% Mn, 0.17 to 0.40% Cu, the balance being aluminum, incidental elements and impurities;

(b) hot rolling said body starting at a temperature in the range of 700° to 975° F. to a thickness of 0.190 to 0.130 inch, annealing said hot rolled product at a temperature of 500° to 700° F. and thereafter cold rolling said annealed product to a thickness in the range of 0.008 to 0.015 inch;

(c) subjecting said sheet stock to a structure refining operation at a temperature in the range of 250° to 400° F. for a period of from 1 to 24 hours to precipitate finally divided magnesium containing constituent;



(d) coating said sheet stock with an organic coating material; and

(e) curing said coating at a temperature in the range of 425° to 500° F. for a period of time in the range of 5 seconds to 20 minutes to avoid dissolving said precipitated constituent to provide said sheet stock having improved levels of tensile strength and high levels of formability.

4,812,184

METHOD OF MANUFACTURING A HOLLOW FILAMENT SEPARATORY MODULE WITH CONSTRICTED BUNDLE END

Myron J. Coplan, Natick, and Salvatore Giglia, Norwood, both of Mass., assignors to Albany International Corp., Albany, N.Y.

Filed Feb. 4, 1986, Ser. No. 826,131
Int. Cl.[4] B01D *13/01*; C08J *9/26*
U.S. Cl. 156—84 **2 Claims**

1. A new method of manufacturing a fiber bundle separatory module comprising the steps of:

forming an annular bundle of resinous hollow fiber;

treating a predetermined region of the annular bundle with a plasticizing medium to cause densification of the individual fiber walls and to create a constricted region of smaller diameter in the annular bundle;

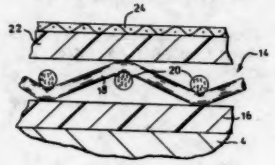
encasing the fiber bundle with a potting material at said predetermined region; and

inserting the potted fiber bundle into a pressure resistant shell.

4,812,185
METHOD OF MAKING A PAPER MACHINE PRESS BELT

Eric R. Romanski, Delmar, N.Y., assignor to Albany International Corp., Menands, N.Y.

Filed Aug. 7, 1987, Ser. No. 83,689
Int. Cl.[4] F16G 1/16; B65H 81/00
U.S. Cl. 156—86 7 Claims

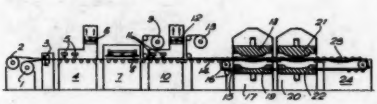


1. A method of making a belt for using in papermaking comprising:
providing a mandrel having a polished smooth surface;
wrapping a first layer of uncured sheet urethane around the mandrel surface;
wrapping a shrinkable web around the first layer;
curing the first layer by heating wherein the shrinkable web applies pressure to the first layer during heating;
unwrapping the shrinkable web and removing it from the cured first layer;
grinding the surface of the cured first layer to smooth it;
placing a woven fabric sleeve having fibers in transverse directions for two-directional support onto the cured first layer;
wrapping a second layer of uncured sheet urethane over the fabric sleeve;
wrapping a shrinkable web around the uncured second layer;
heating the wrapped mandrel to cure the second layer and to entirely bond the first and second layers, encapsulating the fabric sleeve;
remove the shrinkable web;
grinding the surface of the cured urethane to smooth it and to provide a bonded layer of cured urethane of uniform thickness; and
removing the belt, comprising the bonded layer of cured urethane encapsulating the fabric sleeve, from the mandrel.

4,812,186
PROCESS FOR THE MANUFACTURE OF CELLULAR CORE LAMINATED ELEMENTS

Anthony McConnell, Rawtenstall, and Anthony M. Bedford, Ilkely, both of England, assignors to John Cotton Limited, Colne, England

Filed May 14, 1987, Ser. No. 49,557
Claims priority, application United Kingdom, Oct. 30, 1986, 8625997
Int. Cl.[4] B32B 31/20, 33/00
U.S. Cl. 156—90 8 Claims



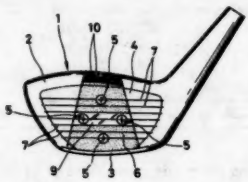
1. A method for the manufacture of a laminated element comprising a thermoformed cellular core material and one or more reinforcing and/of decorative layers which comprises a scrim layer and a first reinforcing layer, applying an adhesive coating to said first reinforcing layer, placing a thermoformable cellular core material on the adhesive coated first reinforcing layer, placing a second reinforcing layer on the thermoformable cellular core layer, applying an adhesive to said second reinforcing layer and applying a decorative layer thereon, placing the foregoing composite in a heated mold to deform the thermoformable cellular core material to the desired final shape and to cure the adhesives.

5. A method according to claim 1 wherein said scrim layer has a layer of material thereon to prevent the adhesive on the first reinforcing layer from penetrating the scrim layer.

4,812,187
METHOD OF MANUFACTURING A GOLF CLUB HEAD

Yukihiro Honma, Kawasaki, Japan, assignor to Kabushiki Kaisha Honma Gorufu Kurabu Seisakusho, Yokohama, Japan

Division of Ser. No. 943,118, Dec. 17, 1986. This application Oct. 9, 1987, Ser. No. 107,705
Claims priority, application Japan, Dec. 26, 1985, 60-199158; Jan. 29, 1986, 61-15909
Int. Cl.[4] B29C 51/14; B32B 31/20
U.S. Cl. 156—245 13 Claims



1. A method of manufacturing a front face structure of a golf club head, comprising the steps of:
providing a front face body formed from a material having a predetermined hardness;
combining a front face insert formed of a metal material which is softer than said front face body and which has a specific gravity greater than that of said front face body, with said front face body in a laminated manner;
combining at least one sheet-like side face insert with the front face body in a laminated manner;
heating the laminated front face body, front face insert and each sheet-like side face insert in a mold;
simultaneously pressurizing the laminated front face body, front face insert and each sheet-like side face insert in said mold to provide an integral structure;
cutting said integral structure to obtain said front face structure having a plurality of faces in which at least a part of said front face insert and said each sheet-like side face insert are exposed at surfaces of said front face structure.

4,812,188
METHOD FOR PRODUCING COVERING PLATE MEMBERS FOR DOOR OR PANEL ELEMENTS

Hardy V. Hansen, Vangagade 14, DK-6870 Ølgod, Denmark

PCT No. PCT/DK86/00114, § 371 Date Jun. 10, 1987, § 102(e) Date Jun. 10, 1987, PCT Pub. No. WO87/02407, PCT Pub. Date Apr. 23, 1987
PCT Filed Oct. 10, 1986, Ser. No. 67,304
Claims priority, application Denmark, Oct. 10, 1985, 4630/85
Int. Cl.[4] B32B 31/20
U.S. Cl. 156—220 11 Claims

1. A method for producing doors or other panel elements having a relief surface comprising the steps of: providing a prefabricated, thin plate member including an only slightly pressed wood fiber or wood chip mass with a content of only partially activated heat-setting binding agent, coating the plate member with paper or veneer, subjecting the thus coated plate

member to a non-abrupt pressing between fully covering die pressing plates having a desired matrix-patrix pattern, supplying heat to the plate member during the non-abrupt pressing in such a manner that the binding agent in the plate member as

well as in a binding layer for the paper or veneer coating is brought to a final setting subsequent to establishing a final pressing pressure, by which the relief pressing is completed and the plate member generally has been substantially compacted.

4,812,189

PROCESS FOR ASSEMBLING TWO FILMS, IN PARTICULAR FILMS OF A FEW MICRONS THICKNESS

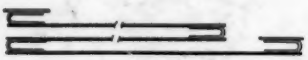
Robert Regipa, 226 avenue Saint-Exupéry, Bâtiment Provence - 31400 Toulouse, France

Filed Mar. 11, 1987, Ser. No. 24,435

Claims priority, application France, Mar. 11, 1986, 86 03553

Int. Cl.[4] B31F *1/00*

U.S. Cl. 156—201 **7 Claims**



1. A process for joining two films (1,2) of a few micron thickness by heat sealing comprising spreading a first of said films while affixing a juction tape (3) along one edge of said first film so that said junction tape (3) is affixed to said one edge of said first film, fastening a planar positioning tape (4) to said junction tape (3), using said positioning tape (4) to handle said first film for aligning said first film (1) with a first longitudinal edge of a second film (2). spreading said second film (2) in longitudinal edge alignment with said first film while gradually removing said positioning tape (4) from said junction tape(3), and heat sealing the longitudinal edge of said second film (2) to said junction tape (3).

4,812,190

THERMALLY INSULATING COVERING AND PROCESS FOR PRODUCING

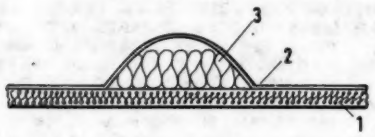
Peter Pelz, Dieselweg 10, 8192 Geretsried 2, Fed. Rep. of Germany

Filed Jan. 30, 1987, Ser. No. 8,970

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1986, 3630852

Int. Cl.[4] B32B *3/22, 3/28, 31/20;* F16L *59/04*

U.S. Cl. 156—221 **10 Claims**



1. A process for producing a thermally insulating covering comprising the steps of (a) impregnating a carrier mat comprised of fibers with a synthetic resin, (b) covering at least one side of said mat with a layer of insulating mat comprised of an insulating inorganic wool, (c) covering at least one side of said insulating mat with an aluminum foil layer, thereby to provide an assembly and (d) compression molding said assembly under heat and pressure in a mold which has depressions formed therein in regions thereof corresponding to said predetermined localized areas.

4,812,191

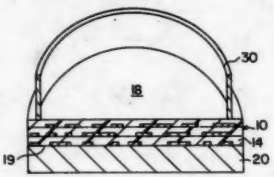
METHOD OF FORMING A MULTILEVEL INTERCONNECTION DEVICE

Chung W. Ho, Monte Sereno, and B. Y. Min, Cupertino, both of Calif., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 1, 1987, Ser. No. 55,794

Int. Cl.[4] B32B *31/00;* B44C *3/02*

U.S. Cl. 156—239 **19 Claims**



1. A method for fabricating a high density electrical interconnection device, said method comprising the steps of:

(a) forming a composite interconnection means from a iquid polymer resin and metallic conductors on a solid substrate;

(b) curing said resin at an elevated temperature to form a solid layered composite interconnection subassembly on said substrate, said substrate having a coefficient of thermal expansion less than said subassembly;

(c) lowering the temperature of the subassembly and said substrate placing said subassembly in tension;

(d) adhering removable support means to the surface of said subassembly opposite the surface of said subassembly contacting said substrate to stabilize said subassembly; and

(e) removing said substrate from said subassembly while the support means is adhered to the subassembly.

4,812,192

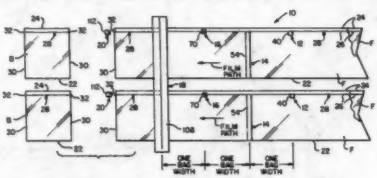
PROCESS AND APPARATUS FOR CUTTING AND SEALING MULTIPLE PLIES OF THERMOPLASTIC MATERIAL HAVING THICKENED SECTIONS

Timothy R. Woods, and R. Douglas Behr, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 11, 1988, Ser. No. 179,791

Int. Cl.[4] B32B *31/18*

U.S. Cl. 156—251 **44 Claims**



1. In a process for cutting multiple plies of thermoplastic material having thickened sections resulting from the presence of zipper closures and for concurrently sealing severed margins thereof, the combination comprising the steps of:

(a) preblocking said thermoplastic material in areas of said

material to be severed and sealed which are located adjacent to the zipper closure portions thereof;

(b) next, blocking said thermoplastic material in areas of said material to be severed and sealed which are located both adjacent to said zipper closure portions and throughout remaining sections thereof to render said thermoplastic material tacky and temporarily stick said multiple plies together in said areas; and

(c) then, contacting all of said areas of said thermoplastic material to be severed and sealed with a heated cutting and sealing element so as to sever all of said multiple plies and concurrently seal said severed margins thereof together.

4,812,193

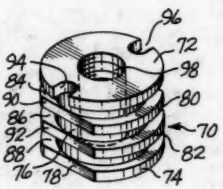
INSET PANEL FASTENER AND METHOD OF USING

Richard F. Gauron, 26020 SE. 158th, Issaquah, Wash. 98027

Filed Dec. 22, 1986, Ser. No. 946,515

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—293 **4 Claims**



1. A method of embedding a fastener element into a panel of composite material, comprising:

providing a skin opening in the panel that is of a first diameter;

providing a cavity within said panel, inwardly of the skin opening, which is larger in diameter than the skin opening;

providing a fastener element made from a resin material;

providing the fastener element with an outer end disk sized to be snugly received within the skin opening and a circular stem projecting inwardly from the outer end disk which is substantially smaller in diameter than the outer end disk;

providing the fastener element with a plurality of axially spaced apart flow control disks on the stem, defining flow passageways around the stem between the flow control disks and between the outer end disk and an adjacent flow control disk, each of which has an axial dimension substantially smaller than the stem diameter between the flow control disks;

providing the flow control disks with flat chord surfaces on diametrically opposite sides of the fastener element, with the flat chord surfaces on one side of the fastener element being parallel to the flat chord surfaces on the opposite side of the fastener element;

providing the regions of the flow control disks which are angularly between the chord flats with diameters substantially equal to the diameter of the outer end disk;

positioning the fastener element with its flow control disks, its flow passageways and the stem within the cavity and with its outer end disk within the skin opening;

providing the outer end disk with a peripheral fill opening which is in axial alignment with a space formed in the cavity radially outwardly of the chord flats on a first side of the fastener element;

providing the outer end disk with a peripheral vent opening diametrically across the fastener element from the fill opening, and in axial alignment with a region in the cavity located radially outwardly from the chord flats on that side of the fastener element;

introducing into the fill opening a potting resin of a type which will make a cohesive bond with the fastener element resin material, and continuing introduction of the potting resin until such potting resin flows first axially through the cavity region in general alignment with the fill opening, and then around the fastener element, including around the stem and through the flow passageways, to the region of the cavity in axial alignment with the vent opening, and then axially through said region to the vent opening.

4,812,194

PROCESS FOR PRODUCING A LINING MEMBER

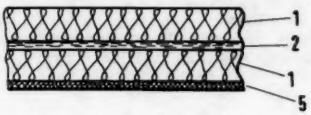
Peter Pelz, Dieselweg 10, 8192 Geretsried, Fed. Rep. of Germany

Filed Jan. 30, 1987, Ser. No. 9,372

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1986, 3629222

Int. Cl.[4] B29C *43/18*; B32B *31/12*; C09J *5/02*

U.S. Cl. 156—307.3 **2 Claims**



1. A process for producing a lining member comprising the steps of:

(a) coating each face of a first layer consisting of a non-woven web of ultra fine glass fibers and weighing 200 to 800 g/m^2 with a binder consisting of a thermosettable polyester resin,

(b) assembling each face of said first layer with a second layer of a preformed foam support layer having a density of from about 20 to 60 kg/m^3 and a thickness of from about 3 to 30 mm,

(c) covering the product of step (b) with a layer of decorative non-woven fabric, and

(d) compressing the product of step (c) at an elevated temperature to produce (1) dimensionally stable depressions in the surface thereof, (2) firm flat zones in edge-adjacent regions thereof, and (3) corrugated rib-like members in the surface thereof.

4,812,195

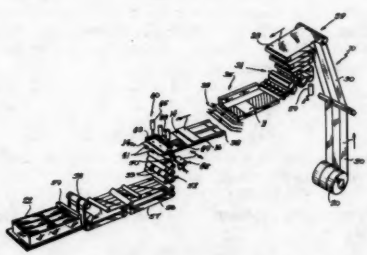
METHOD AND APPARATUS FOR MAKING OUTSERTS

Michael Vijuk, Oakbrook, Ill., assignor to Vijuk Bindery Equipment, Inc., Elmhurst, Ill.

Filed Dec. 12, 1986, Ser. No. 940,890

Int. Cl.[4] B65B *11/48*

U.S. Cl. 156—357 **21 Claims**



1. In an outsert forming apparatus for completely folding sheets into outserts having a plurality of folded sheet sections stacked one on another and with an outer wrap-around sheet

section adhered to the stacked sheet sections, said apparatus comprising:

a sheet feeder for feeding sheets into a folding station,

a folder for folding substantially all of each sheet with a plurality of folds to form a thick, heavy, folded, stacked sheet section and leaving a wrap-around fold sheet section,

a folded sheet conveyor for conveying the folded, stacked sheet section and the wrap-around sheet section from the folder to an outsert forming station,

a support at the outsert forming station for holding the folded sheet substantially horizontally,

adhesive applying means to apply adhesive to a folded sheet,

a folding member disposed over the folded sheet and for selective downward movement to push the thicker wrap-around folded sheet section downwardly adjacent the thicker, heavier, stacked sheet section,

a folding and slitting unit having a pair of folding rollers having nip into which is pushed the folded thinner sheet section with the folding rollers pushing the wrap-around folded sheet section against the thick, heavy folded section to form an outsert,

said folding and slitting unit having a pair of slitting rollers to slit the folded outsert into a plurality of folded outserts, and means to discharge the folded outserts from the apparatus.

4,812,196

APPARATUS FOR STICKING RUBBER SHEET MATERIAL

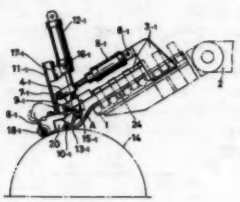
Ryutaro Ishii, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Oct. 13, 1987, Ser. No. 106,691

Claims priority; application Japan, Oct. 13, 1986, 61-241461

Int. Cl.[4] B29D *30/24, 30/28*

U.S. Cl. 156—412 **3 Claims**



1. An apparatus for sticking a rubber sheet material, comprising: a building drum, a presser to secure a forward end of the rubber sheet material to said drum, said presser being provided on both ends thereof with means to attract the presser to said drum, a sponge material covering said presser except end parts thereof, and means to more the presser to the forward end of the sheet material and place the presser on the sheet material while the rubber is being stuck to the building drum and to finally separate the presser from the building drum after sticking is completed.

4,812,197

FIRE BUILDING DRUM

Anthony R. Wright, Merseyside, United Kingdom, assignor to Apsley Metals Limited, United Kingdom

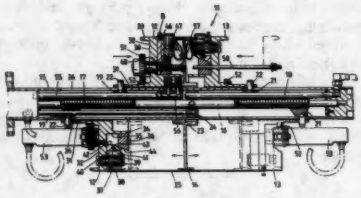
Filed Feb. 12, 1988, Ser. No. 155,560

Claims priority, application United Kingdom, Feb. 12, 1987, 8703224

Int. Cl.[4] B29D *30/24*

U.S. Cl. 156—415 **8 Claims**

1. In a cylindrical tire building former having a set of radially expandable segments which are radially moveable by engagement of each segment with a respective cam surface on an axially moveable wedge member characterised the improvement wherein the wedge member is axially moved along



a plurality of circumferentially spaced screw struts which are each rotated by a planet gear fixed thereto, the planet gears being driven by a sun gear.

4,812,198

TAB ATTACHING DEVICE USED IN AN AUTOMATIC DEVICE FOR PREPARING PAPER ROLLS FOR WEB PASTING

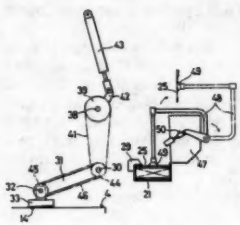
Masanobu Fuke; Takemi Watanabe, both of Osaka, and Noriyuki Shiba, Tokyo, all of Japan, assignors to Kabushiki Kaisha Kaneda Kikai Seisakusho, Osaka and Kabushiki Kaisha Tokoyo Kikai Seisakusho, Tokyo, both of, Japan

Filed Dec. 17, 1987, Ser. No. 133,976

Claims priority, application 05251987, May 25, 1987, 62-78581[U]

Int. Cl.[4] B65H *19/18;* **B41F** *13/56;* **B31F** *5/06*

U.S. Cl. 156—497 **4 Claims**



1. A device for attaching one end of a tab to a leading end of a paper roll, with a tab blank comprising a substantially elongated rectangular support paper, adhesive layers provided on the upper and lower surfaces of the support paper, and upper and lower protective-coating films provided on the adhesive layers, with the upper protective-coating film and the support paper being divided into first and second parts along a transverse line at one end, which comprises:

a tab loading device for keeping tab blanks in a pile;

a tab retaining device for taking and holding the first part of the upper protective-coating film and the support paper and the lower protective-coating film of the topmost of the tab blanks which are kept in a pile in the tab loading device;

a tab transporting/pressing device for gripping the second part of said upper protective-coating film and said support paper and transporting them away from said tab retaining device while said tab retaining device is holding said first parts of the upper protective-coating film and the support paper and the lower protective-coating film to thereby remove the lower protective-coating film from the lower side of the second part of said support paper and, thereafter, transferring and pressing one end of the second part of said support paper whose lower protective-coating film

has been removed, onto the surface of the leading end of the paper roll; and

a protective-coating film discharging device for carrying away for disposal the lower protective-coating from said tab retaining device.

4,812,199

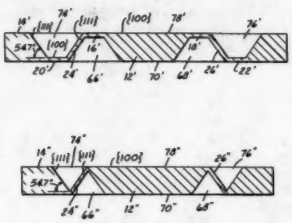
RECTILINEARLY DEFLECTABLE ELEMENT FABRICATED FROM A SINGLE WAFER

Edward N. Sickafus, Grosse Ile, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 21, 1987, Ser. No. 135,204

Int. Cl.[4] H01L *21/306*

U.S. Cl. 156—626 **2 Claims**



1. A method for forming a suspended element from a {100} silicon substrate wherein movement of the suspended element is rectilinear and proportional to an external force, comprising the steps of:

etching two cavities in said substrate thereby defining a center member between said cavities having a first planar face and an opposing second planar face, said cavities also defining a supporting frame connected to opposing ends of said center member;

forming a passivation layer on said first planar face with a pair of passivation openings symmetrically positioned on said first planar face for anisotropic etching in a subsequent step, each of said passivation openings having dimensions such that the set of {111} planes adjacent said passivation opening define a point of convergence beyond said silicon substrate;

applying an anisotropic etching to said passivation openings for forming a pair of recesses in said center member thereby defining said suspended element; and

timing said step of anisotropic etching such that each of said pair of recesses forms a narrowed portion of said center member between said second planar surface and each of said recesses, said narrowed portions defining a pair of flexing members for providing rectilinear deflection of said suspended element in linear proportion to the applied force.

2. A method for forming a suspended element from a {100} silicon substrate wherein movement of the suspended element is rectilinear and proportional to an external force, comprising the steps of:

etching two cavities in said substrate thereby defining a center member between said cavities having a first planar face and an opposing second planar face, said cavities also defining a supporting frame connected to opposing ends of said center member;

forming a passivation layer on said first planar face having a first pair of passivation openings symmetrically positioned on said first planar surface and forming a passivation layer on said second planar surface having a second pair of passivation openings symmetrically positioned on said second planar surface and offset from said first pair of passivation openings, each of said passivation openings having dimensions such that the set of {111} planes adjacent each of said passivation opening define a point of convergence within said silicon substrate;

applying an anisotropic etchant to said passivation openings for forming a frrst pair of recesses through said first planar surface and a second pair of recesses through said second planar surface wherein said suspended element is defined as the portion of said center member between said first pair of recesses; and

timing said step of anisotropic etching to form a narrowed portion of said center member between each of said first pair of recesses and each of said second pair of recesses, said narrowed portions defining a pair of flexing members for providing rectilinear deflection of said suspended element in linear proportion to the applied force.

4,812,200

METHOD FOR GENERATING RESIST STRUCTURES

Siegfried Birkle, Hoechstadt/Aisch; Recai Sezi, Roettenbach; Hans-Dieter Feucht, Erlangen, and Rainer Leuschner, Grossenseebach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 10, 1988, Ser. No. 166,436

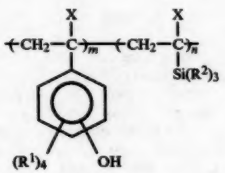
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1987, 3707841

Int. Cl.[4] B44C *1/22*; B29C *37/00*; C03C *15/00, 25/06*

U.S. Cl. 156—643 **3 Claims**

1. A method for generating a resist structure through the use of a silicon-containing positive resist, and a photoreactive component, in combination with masking and irradiating with UV-radiation, comprising:

applying a resist material of a vinyl phenolvinyl silane copolymer having formula I



(I)

wherein

m+n is 1 and n is maximally 0.55;

X is H, CH_3, C_2H_5, or halogen;

R^1 is H, CH_3, C_2H_5, or halogen;

R^2 is H, CH_3, C_2H_5, C_3H_7, or C_6H_5;

said X, R^1, and R^2 being identical or different.

4,812,201

METHOD OF ASHING LAYERS, AND APPARATUS FOR ASHING LAYERS

Hiroyuki Sakai; Kazutoshi Yoshioka; Kimiharu Matsumura; Keisuke Shigaki, all of Kumamoto; Yutaka Amemiya, Yamanashi; Shunichi Iimuro, Yamanashi; Haruhiko Yoshioka, Yamanashi, and Teruhiko Onoe, Kofu, all of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

Filed Jul. 15, 1987, Ser. No. 73,978

Claims priority, application Japan, Jul. 25, 1986, 61-175141; Jul. 25, 1986, 61-175142; Aug. 29, 1986, 61-203250; Nov. 25, 1986, 61-280482; Nov. 25, 1986, 61-280483; Dec. 25, 1986, 61-314093

Int. Cl.[4] H01L *21/302*

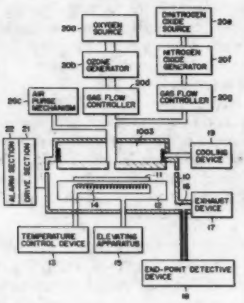
U.S. Cl. 156—643 **4 Claims**

1. An ashing method, comprising the steps of:

preparing a gas mixture of ozone and nitrogen oxides excited by passing an electric discharge through dinitrogen oxide;

generating oxygen atom radicals in said gas mixture by heating said gas mixture in a reaction region above a heated substrate, said gas mixture uniformly flowing over the surface layer of the substrate and the reaction region

being the zone between the surface of the substrate and a plane 0.5–20 mm high above the substrate; and



ashing a desired portion of the surface layer of said substrate by reaction of the surface layer with said oxygen atom radicals.

4,812,202

PROCESS FOR METAL-PLATING CERAMIC SURFACES

August F. Bogenschütz, Oberdischingen; Josef L. Jostan, and Robert Ostwald, both of Ulm, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 7, 1986, Ser. No. 885,254

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1985, 3523957

Int. Cl.[4] B44C *1/22*

U.S. Cl. 156—628 **23 Claims**

1. A process for treating a ceramic substrate preparatory to wet metal-plating, the process comprising the steps of:

providing a single pretreatment bath comprised of a pretreatment medium and at least one precoating agent, said pretreatment medium being selected from the group consisting of an alkaline pretreatment medium and an acidic pretreatment medium, and serving to clean, roughen and chemically activate the ceramic surface, and said at least one precoating agent being selected from the group consisting of an adhesion promoter, a sensitizer, an activator, and precursors thereof, and serving to precoat the ceramic surface;

immersing said ceramic substrate in the single pretreatment bath to simultaneously clean, roughen, chemically activate and precoat the ceramic substrate in a single step prior to wet metal-plating, said single step being conducted at a temperature higher than ambient temperature and in the absence of an external electric current;

removing the ceramic substrate from the single pretreatment bath; and

placing the ceramic substrate within a wet metal-plating bath and wet metal-plating said ceramic substrate.

4,812,203

EVAPORATOR

Kenji Obata, Musashino; Nobuhiko Yoneda, Omuta; Masabumi Kataita, Omuta; Yoshihiro I, Omuta, and Hironori Yamashita, Omuta, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Continuation of Ser. No. 767,999, Aug. 21, 1985, abandoned. This application Jun. 23, 1987, Ser. No. 65,625

Claims priority, application Japan, Aug. 31, 1984, 59-180325

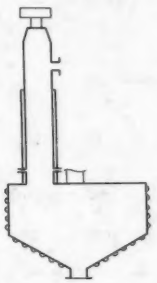
Int. Cl.[4] B01D *1/22*

U.S. Cl. 159—6.2 **4 Claims**

1. An evaporator apparatus, comprising:

a first, centrifugal, falling-film evaporator comprising a cylindrical housing having a vertical axis, a first shaft coaxially disposed in said housing and a plurality of vanes connected to said first shaft for stirring liquid to be evaporated and spreading said liquid in a thin film on the inner surface of said housing, and a first discharge opening at the lower end of said housing for discharging evaporation residue from said first falling-film evaporator;

a second evaporator located directly below said first falling-film evaporator and comprising a vessel having a vertical axis and a sidewall portion comprised of an inverted frusto-conical section, a top wall covering the upper end of said vessel and a second discharge opening extending from the bottom end of said vessel for discharging evaporation residue from said second evaporator, a second shaft disposed inside said vessel, a plurality of scrapers mounted on said second shaft for rotation therewith for scraping off material deposited on the inner surface of said inverted frusto-conical section, said plurality of scrapers are disposed only in said inverted frusto-conical section, external



heating means on the outer surface of said inverted frusto-conical section for evaporating volatile components of a material in said second evaporator, said housing of said first falling-film evaporator is positioned at one lateral side of said second shaft and said first shaft is laterally offset from said second shaft, a feed opening on said top wall directly connected to said first discharge opening of said first falling-film evaporator so that the evaporation residue discharged through said first discharge opening of said first falling-film evaporator flows by gravity through said feed opening, said feed opening also permitting an upward flow therethrough of volatilized components from said second evaporator into said first falling-film evaporator, said feed opening being of smaller diameter than said vessel and located to one lateral side of said vertical axis of said vessel and is radially inwardly spaced from the vessel wall so that the evaporation residue drops vertically onto the inner surface on said inverted frusto-conical section of said second evaporator.

4,812,204

PROCESS FOR OBTAINING BORIC ACID TREATED ASBESTOS FIBER

Pierre Delvaux, Bromptonville, and Normand Lesmerises, Rock Forest, both of Canada, assignors to Ceram-Sna, Inc., Sherbrooke, Canada

Filed Jul. 24, 1987, Ser. No. 77,394

Int. Cl.[4] C03B *37/00*; D21H *5/18*; C04B *14/40*

U.S. Cl. 162—3 **2 Claims**

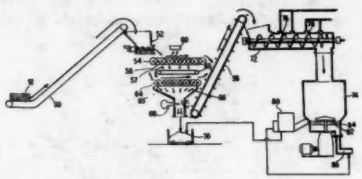
1. A process for preparing borated asbestos fibers which comprises heating a homogeneous dry mixture consisting essentially of asbestos fibers and boric acid to a temperature of from 100° to 350° C. for a period of from 0.05 to 2.00 hours such that bonds are formed between the boric acid and the asbestos fibers.

4,812,205

PROCESS FOR SECONDARY FIBRE PROCESSING

Luigi Silveri, Rockford, Ill., and Stavros Paraskevas, Pittsfield, Mass., assignors to Beloit Corporation, Beloit, Wis.

Filed Jan. 25, 1988, Ser. No. 148,456
Int. Cl.[4] B02C *23/08, 23/14*
U.S. Cl. 162—4 6 Claims



1. A method of processing baled secondary fibre furnishes for the manufacture of paper and paperboard products comprising the steps of:

conveying the baled furnish to an extruder for breaking the bale and moderately reducing the size of the furnish;

separating abrasive contaminants from fibrous material in the furnish by passing the furnish over a first disk screen, the disk screen separating the furnish into fibrous material and rejected material;

moving the fibrous material to a conveying apparatus for conveying the fibrous material to a repulping vessel;

steaming and wetting the fibrous material in the conveying apparatus;

conveying the steamed and wetted fibrous material to the repulping vessel; and

removing plastic contaminants from the fibrous material and repulping the fibrous material into a pulp.

4,812,206

PROCESS FOR BLEACHING LIGNOCELLULOSIC MATTER

Michel Devic, Sainte Foy Les Lyon, and Robert Angelier, Echirolles, both of France, assignors to Atochem, France

Filed Sep. 22, 1987, Ser. No. 99,762
Claims priority, application France, Sep. 23, 1986, 86 13546
Int. Cl.[4] D21C *3/26, 3/00*
U.S. Cl. 162—19 12 Claims

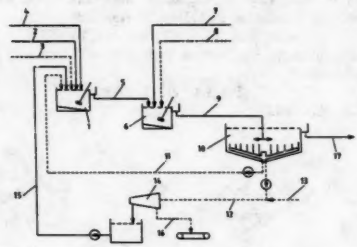
1. A process for bleaching a lignocellulosic matter in the form of a mechanical, thermomechanical chemicomechanical or chemicothermomechanical papermaking pulp, or of wood chips while being converted into one of these pulp types which comprises in sequence, pretreating the lignocellulosic matter with at least one metal-complexing or sequestering agent, bleaching said lignocellulosic matter with a bleaching treatment using a reducing agent at a pH of between 8 and 12, washing to remove said reducing agent, and bleaching with a bleaching treatment using an oxidizing agent, characterized in that, after pretreatment, the lignocellulosic matter undergoes a washing operation with an efficiency greater than 96% before undergoing in succession said bleaching treatment using a reducing agent, said washing operation to remove the reducing agent and said bleaching treatment using an oxidizing agent.

4,812,207

METHOD OF REMOVING LIGNIN FROM BLEACH PLANT EFFLUENTS

Johan Guilichsen, Sjundeå, and Pertti Hynninen, Helsinki, both of Finland, assignors to A. Ahlstrom Corporation, Karhula, Finland

Continuation of Ser. No. 882,923, filed as PCT FI 85/00091 on Nov. 15, 1985, published as WO86/03236 on Jun. 5 1986, abandoned. This application Nov. 18, 1987, Ser. No. 122,598
Claims priority, application Finland, Nov. 19, 1984, 844532
Int. Cl.[4] C02F *1/58;* D21C *11/00*
U.S. Cl. 162—29 10 Clrims



1. A method of removing lignin from bleach plant effluents, comprising the steps of:

in an acidous stage, acidifying a sludge containing cellulose fibers, utilizing acidous bleach plant effluent, so as to produce an effluent-sludge solution having a pH in the range of 1.6–3.0, and

in an alkaline stage, adding alkaline bleach water to the acidous effluent-sludge solution, thereby causing lignin present in said effluent sludge to be bound to said fibers;

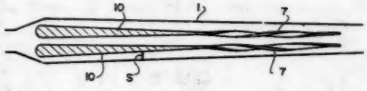
separating a main portion of the fibers, with lignin bound thereto, from the alkaline treated acidous effluent-sludge solution; and recirculating a portion of the separated fiber-containing portion of the effluent-sludge solution to the acidous stage to reuse the fibers.

4,812,208

HEADBOX FOR PAPER MACHINE WITH PARALLEL TWISTED PLATES

Masami Yuasa; Kazumi Abe, both of Tokyo; Masaji Shibamoto, Yokohama, and Masahiro Yakabe, Narita, all of Japan, assignors to Seishi Gijutsu Kenkyu Kumiai, Tokyo, Japan

Continuation of Ser. No. 888,845, Jul. 24, 1986, abandoned. This application Sep. 21, 1987, Ser. No. 98,716
Claims priority, application Japan, Jul. 30, 1985, 60-166813
Int. Cl.[4] D21F *1/02*
U.S. Cl. 162—343 7 Claims



1. In a headbox for a papermaking machine having an inlet for papermaking slurry, a passage, a slice outlet for the papermaking slurry, and a plurality of straightening tubes placing the inlet in flow communication with the passage, the improvement comprising: a plurality of base plate means disposed in said passage downstream of the tubes in the direction of the flow of the papermaking slurry and having a thicker cross section toward the straightening tubes and a thinner cross section toward the slice outlet, whereby the cross section of said passage gradually increases downstream; twisted plate means connected to said base plate means and comprising a

plurality of parallel spaced ribbon-shaped plates extending in said passage adjacent to said slice outlet in the direction of flow of the papermaking slurry, each plate being substantially rectangular with a longitudinal axis and being completely twisted about its respective longitudinal axis several times, to thereby cause the slurry to swirl in the direction of flow of the slurry and cause three dimensional dispersion of the slurry.

4,812,209

HEADBOX FOR THE PRODUCTION OF FIBROUS STOCK WEBS

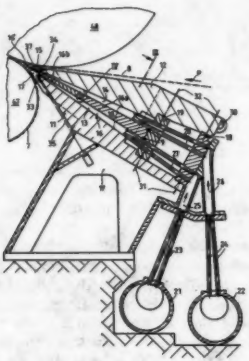
Gernot Kinzler, Heidenheim, and Gerhard Layher, Königsbronn, both of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Feb. 25, 1987, Ser. No. 18,455

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1986, 3607306

Int. Cl.[4] D21F *1/06*

U.S. Cl. 162—343 **29 Claims**



1. A headbox for the production of fibrous stock webs, comprising:

a nozzle chamber with a slice gap defined by a top lip wall, a bottom lip wall and two side walls, with the top and the bottom lip wall converging in the direction of flow,

the nozzle chamber being subdivided for the production of multi-layer fibrous stock webs into at least two machine-wide flow channels by at least one, at least approximately wedge-shaped partition wall which extends in the direction of flow and from one side wall to the other;

the partition wall extending in the direction of flow through the slice gap;

each of the two side walls being subdivided along the partition wall into at least two side wall sections;

the partition wall being clamped at each side wall between and by the side wall sections thereof against displacement relative thereto in the area.

4,812,210

MEASURING SURFACTANT CONCENTRATION IN PLATING SOLUTIONS

William D. Bonivert; Joseph C. Farmer, both of Livermore, and John T. Hachman, Stockton, all of Calif., assignors to The United States Department of Energy, Washington, D.C.

Filed Oct. 16, 1987, Ser. No. 109,008

Int. Cl.[4] G01N *27/46*

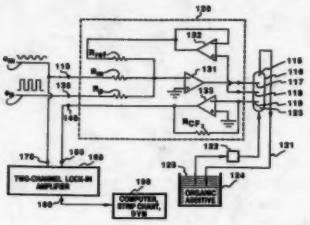
U.S. Cl. 204—1 T **12 Claims**

1. A method for measuring the concentration of a surfactant in a fluid electrolyte containing metal ions, comprising the steps of:

surrounding a probe with the electrolyte, said probe comprising a reference electrode, a counter electrode, and a working electrode, said counter and working electrodes having outer surfaces more noble than the outer surfaces of said reference electrode, said electrodes being stationary in said probe relative to each other;

applying a straight DC bias voltage at said counter electrode, the magnitude of said DC bias being selected to cause only underpotential deposition of metal from said electrolyte on said working electrode;

adjusting the magnitude of said DC bias voltage responsive to the voltage at said reference electrode to maintain



underpotential deposition of metal on said working electrode;

applying an AC modulation voltage at the resonant frequency of said working electrode to said counter electrode;

measuring the phase difference between the modulated voltage applied to said counter electrode and the current response to the modulated voltage at said working electrode; and

correlating the phase difference to the concentration of surfactant in the electrolyte.

4,812,211

PROCESS AND SYSTEM FOR ELECTRODEPOSITION COATING

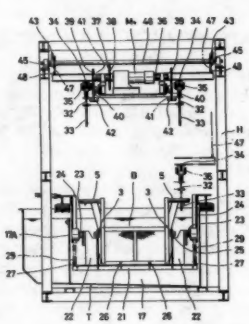
Hideyuki Sakai, 144, Okunagairi, Ohnishi-cho, Okazaki-shi, Aichi-ken, Japan

Filed Mar. 4, 1988, Ser. No. 164,417

Claims priority, application Japan, Oct. 31, 1987, 62-276216

Int. Cl.[4] C25D *9/00, 13/00, 17/06, 17/26*

U.S. Cl. 204—180.2 **7 Claims**



4. A process for the electrodeposition coating of materials which includes the steps of

(A) loading materials to be electrodeposition coated into a basket,

(B) introducing said basket into a plurality of tanks arranged in a selected order and containing the liquids required for

the electrodeposition coating of the materials, thereby immersing the materials in the liquids, and

(C) swinging the basket and the materials contained therein after introducing the basket into each said tank,

(D) said basket comprising

(i) a box-shaped body including a frame and a wire netting of expanded metal connected to the frame to form side walls and a bottom for said body, said body having an open top,

(ii) a first pair of horizontal arms projecting outwardly from two of the opposed side walls of said body,

(iii) a pair of vertical members projecting upwardly from the tops of said two opposed side walls of said body, and

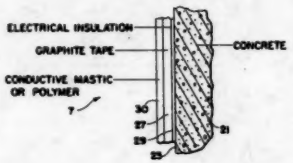
(iv) a second pair of horizontal arms projecting outwardly from the upper portions of said pair of vertical members.

4,812,212

APPARATUS FOR CATHODICALLY PROTECTING REINFORCING MEMBERS AND METHOD FOR INSTALLING SAME

James Dimond, Burton, and William Swackhammer, Hudson, both of Ohio, assignors to Harco Technologies Corporation, Medina, Ohio

Filed Sep. 8, 1987, Ser. No. 93,609
Int. Cl.[4] C23F *13/00*
U.S. Cl. 204—147 **25 Claims**



20. A method of installing an anode structure on a reinforced concrete structure containing electrically conducting reinforcing members to be cathodically protected comprising:

applying an electrically conductive graphite tape having a first electrical resistivity and an electrically insulating backing to a surface of a reinforced concrete structure to be cathodically protected so that said backing is disposed between said tape and said surface and said tape does not directly contact said surface; and

applying an electrically conductive anode coating having an electrical resistivity smaller than said first electrical resistivity over said tape and on said surface adjacent said tape.

4,812,213

PROCESS FOR THE MANUFACTURE OF MULTI-LAYER CIRCUITS WITH DYNAMIC FLEXING REGIONS AND THE FLEXIBLE CIRCUITS MADE THEREFROM

Carlos L. Barton, Brooklyn, Conn.; Adrienne Lindsay, Chandler, and Samuel W. Henson, Mesa, both of Ariz., assignors to Rogers Corporation, Rogers, Conn.

Filed May 6, 1988, Ser. No. 190,890
Int. Cl.[4] C25D *5/02, 5/56*
U.S. Cl. 204—15 **16 Claims**

1. A method of manufacturing a flexible circuit comprising:

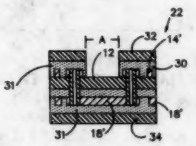
providing a circuit laminate comprising a first flexible non-conductive carrier film adhesively secured to a first conductive layer by a first layer of adhesive;

forming at least two spaced through-holes in said circuit laminate with the area adjacent said through holes defining a bending region;

vacuum depositing a thin layer of conductive material onto at least said first carrier film, and into said through holes;

forming a first circuit pattern on said thin conductive layer vacuum deposited onto said first carrier film in a location outside of said bending region;

forming a second circuit pattern from said first conductive layer, said second circuit pattern being located in at least a portion of said bending region; and



removing the portion of said thin conductive layer vacuum deposited onto said first carrier film which is located in said bending region to thereby expose said first carrier film and removing the portion of said thin conductive layer vacuum deposited onto said first carrier film which is located between said first circuit pattern.

4,812,214

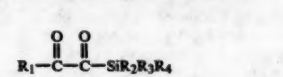
METHOD OF COMBINING SILOXY GROUPS WITH KETENE-REACTIVE COMPOUNDS

Bradford B. Wright, North St. Paul, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Sep. 28, 1987, Ser. No. 101,589
Int. Cl.[4] B01J *19/08*
U.S. Cl. 204—157.74 **9 Claims**

1. The method of combining a siloxy group (-SiO-) with a ketene-reactive compound to form a siloxy-containing product comprising:

(a) subjecting a silyl diketone to photolysis under conditions effective for generating a siloxy ketene intermediate therefrom, said silyl diketone having the formula



wherein Si is silicon, R_1 and R_4 are hydrocarbon groups containing from 1 to 18 carbons, and R_2 and R_3 are hydrocarbon groups containing from 1 to 6 carbons, said photolysis being carried out by irradiating said silyl diketone with light of a wavelength from 200 to 800 nm; and, thereafter,

(b) contacting the generated siloxy ketene intermediate with a ketene-reactive compound under conditions effective for reaction therewith, said compound being selected from the group consisting of (i) a diene polymer containing a plurality of unsaturated carbon bonds, (ii) an alkylene or cycloalkylene compound containing at least one unsaturated linkage; and (iii) an aldehyde containing one or more aldehyde groups.

4,812,215

LOW TEMPERATURE CURABLE AQUEOUS ELECTRODEPOSITABLE COATING COMPOSITIONS

Richard F. Karabin, Ruffs Dale; Ken W. Niederst; Michael G. Sandala, both of Allison Park, and Edward R. Coleridge, Lower Burrell, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 947,292, Dec. 29, 1986, abandoned. This application Aug. 12, 1988, Ser. No. 231,335
Int. Cl.[4] C08L *63/00*; C25B *13/06*
U.S. Cl. 204—181.7 **21 Claims**

17. A method of electrocoating an electrically conductive surface serving as a cathode comprising passing an electric current between said cathode and an anode in electrical

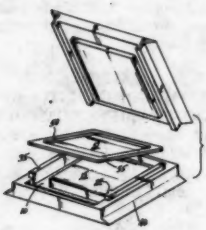
contact with an aqueous cationically electrodepositable coating composition, comprising a ternary sulfonium or quaternary phosphonium group containing resin, an aminoplast or phenoplast crosslinking agent and a catalytic amount of a non-ionic ester of a sulfonic acid as latent acid catalyst to catalyze the reaction between the sulfonium or phosphonium group containing resin and the aminoplast or phenoplast crosslinking agent.

4,812,216

METHOD OF HANDLING AND TRANSPORTING A TRANSFER MEMBRANE USED IN A BLOTTING APPARATUS

Stanley M. Hurd, Hamden, and Richard E. Kouri, New Haven, both of Conn., assignors to Bios Corporation, New Haven, Conn.

Filed Aug. 28, 1987, Ser. No. 90,739
Int. Cl.[4] G01N *27/28*
U.S. Cl. 204—182.8 **10 Claims**



1. A method of utilizing a transfer membrane in processing biological components wherein the membrane is transported to and from a plurality of processing stations comprising the steps of:

providing a transfer membrane having top and bottom surfaces and a peripheral edge,

providing a rigid support means,

securing permanently said rigid support means to at least a portion of the peripheral edge of the transfer membrane to create a composite, single piece part, and

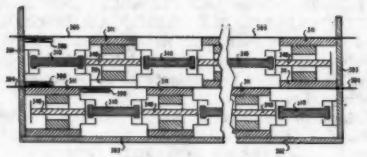
transporting said transfer membrane in said composite, single piece part arrangement to and from said processing stations.

4,812,217

METHOD AND APPARATUS FOR FEEDING AND COATING ARTICLES IN A CONTROLLED ATMOSPHERE

Carroll H. George, Norwood, N.Y., and Ray D. Rust, Berkeley Heights, N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 27, 1987, Ser. No. 42,508
Int. Cl.[4] C23C *14/00*
U.S. Cl. 204—192.12 **22 Claims**



1. A method of depositing a metallic coating on an article, comprising the steps of:

evacuating a closed chamber and providing a controlled gaseous environment at low pressure within the closed chamber;

positioning a plurality of bidirectional targets arranged in a plurality of rows of bidirectional targets with the bidirectional targets in each row being sequentially positioned one after another within the closed chamber, and the rows of bidirectional targets being substantially parallel with one another;

selectively transporting articles to be metallically coated along a plurality of defined transport paths, with each transport path being located substantially equidistantly intermediate to two adjacent rows of bidirectional targets; and

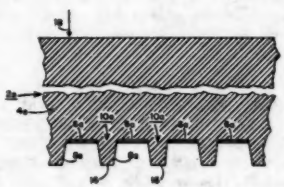
generating a magnetic field within the closed chamber which has lines of flux adjacent to a surface of the article which are substantially parallel to the surface of the article by creating opposing magnetic fields with additional magnetic sources located between adjacent bidirectional targets in each row of bidirectional targets and oppositely poled to magnetic sources included with each bidirectinal target in order to minimize article heating and to enhance the sputter yield of the bidirectional targets so that emissions of at least a majority of free metallic atoms from the target have a trajectory that instersects the surface of the article on an adjacent transport path.

4,812,218

METHOD OF MAKING A DIGITAL RECORDING MEDIUM

Arthur M. Gerber, 202 Ocean, Solana Beach, Calif. 92075

Division of Ser. No. 700,735, Feb. 11, 1985, abandoned. This application Aug. 20, 1987, Ser. No. 87,650
Int. Cl.[4] C23C *14/34*; B05D *5/06*
U.S. Cl. 204—192.27 **9 Claims**



1. The method of making a medium for the storage of digital data comprising the steps of

providing a substrate of transparent thermoplastic material having first and second opposing surfaces,

forming in said first surface an array of rows of equally spaced depressions,

depositing a reflecting coating on said first surface and on the bottom of each of said depressions, said coating being capable of a significant reduction in reflectivity when exposed to focused energy, and

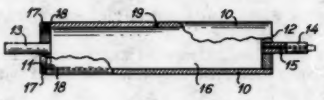
removing reflective coating from areas between said depressions of said first surface.

4,812,219

METHOD OF PRODUCING A SURFACE SLEEVE FOR A PLATE CYLINDER FOR PRINTING PURPOSES

Jens E. Sattrup, Byaekpark 37, DK-3520 Farum, and Ole Brondsted, Soborg, both of Denmark, assignors to Jens Erik Sattrup, Farum, Denmark

PCT No. PCT/DK86/00136, § 371 Date Aug. 19, 1987, § 102(e) Date Aug. 19, 1987, PCT Pub. No. WO87/03843, PCT Pub. Date Jul. 2, 1987
PCT Filed Dec. 22, 1986, Ser. No. 93,745
Int. Cl.[4] B41F *13/10*; C25D *7/04*
U.S. Cl. 101—375 28 Claims



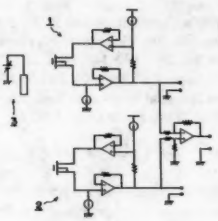
1. A method of producing a surface sleeve for a plate cylinder, said method comprising, arranging a basic sleeve made from an electrically conductive material and having inner and outer circularly cylindrical peripheral surfaces, tightly around an outer circularly cylindrical peripheral surface of a supporting mandrel, electrolytically depositing an inner metal layer on the outer peripheral surface of the basic sleeve, electrolytically depositing an outer copper layer with a smooth substantially circularly cylindrical outer surface, on said inner metal layer, and cutting off opposite outer end portions of the sleeve after depositing the outer copper layer thereon.

4,812,220

ENZYME SENSOR FOR DETERMINING A CONCENTRATION OF GLUTAMATE

Takeaki Iida, Niiza, and Takeshi Kawabe, Tokyo, both of Japan, assignors to Unitika, Ltd., Hyogo, Japan

Filed Aug. 12, 1987, Ser. No. 84,570
Claims priority, application Japan, Aug. 14, 1986, 61-190840
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—403 2 Claims



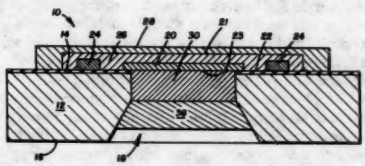
1. An enzyme sensor for determining a concentration of glutamate comprising an immobilize enzyme acting specifically to a substrate and a transducer for converting the quantitative change of a substance or heat which is produced or consumed during an enzyme reaction to an electrical signal, wherein the enzyme is glutamine synthetase and the transducer is the pH glass electrode or ion-sensitive field-effect transistor.

4,812,221

FAST RESPONSE TIME MICROSENSORS FOR GASEOUS AND VAPOROUS SPECIES

Marc J. Madou, Palo Alto, and Takaaki Otagawa, Fremont, both of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Jul. 15, 1987, Ser. No. 73,495
Int. Cl.[4] G01N *27/54*
U.S. Cl. 204—412 24 Claims



1. A sensor for gaseous and vaporous species, comprising:
a gas and vapor impervious substrate having first and second surfaces facing generally away from one another and having a passage through which gas can flow extending therethrough from the first surface to the second surface;
a gas permeable sensing electrode positioned across and substantially blocking off said passage;
an electrolytic medium in contact with said first surface and with said electrode; and
an additional electrode in contact with said electrolytic medium via which it is in electrical contact with said sensing electrode, said additional electrode being electronically isolated from said sensing electrode other than via said electrolytic medium.

4,812,222

PRODUCTION OF LUBRICASTING OILS BY HYDROCRACKING

Garry W. Kirker, Washington Township, Warren County, and Philip Varghese, Voorhees, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 28,813, Mar. 23, 1987, abandoned, which is a continuation-in-part of Ser. No. 879,787, Jun. 27, 1986, which is a continuation-in-part of Ser. No. 687,414, Dec. 28, 1984, abandoned. This application Jul. 11, 1988, Ser. No. 218,436
Int. Cl.[4] C10G *65/12*
U.S. Cl. 208—89 22 Claims

1. A process for producing a lubricating oil base stock from a hydrocarbon feedstock which comprises:
hydrocracking a hydrocarbon feedstock having a boiling point above about 343° C. (650° F.) and containing polycyclic aromatic hydrocarbons in the presence of a catalyst having cracking and hydrogenation activity and comprising a layered silicate having a framework composed essentially of only tetrahedral sheets, containing interspathic polymeric silica and interspathic polymeric oxide of an element selected from the group consisting of Al, B, Cr, Ga, In, Mo, No, Ni, Ti, Tl, W and Zr, in order to produce a hydrocrackate having a boiling point above about 343° C. (650° F.) which contains a lesser proportion of polycyclics than said charge stock.

4,812,223

HYDROCRACKING NAPHTHAS USING MILDLY STEAMED, NOBLE METAL-CONTAINING ZEOLITE BETA

Karlton J. Hickey, Jr., Broomall, Pa., and Roger A. Morrison, Deptford, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 1, 1987, Ser. No. 45,487
Int. Cl.[4] C10G 47/02
U.S. Cl. 208—111 15 Claims

1. A method for hydrocracking a naphtha which comprises contacting said naphtha with a noble metal-containing zeolite beta naphtha hydrocracking catalyst at a pressure of about 0 to about 2000 psig, a temperature of about 400° to about 650° F., a hydrogen or hydrocarbon molar ratio of about 0.1 to 1 to about 15 to 1 and a weight hourly space velocity of about 0.5 to about 20, whereby naphtha hydrocracking activity of said catalyst is enhanced by mild steaming of said zeolite beta catalyst prior to said contacting, said mild steaming being accomplished by steaming said zeolite catalyst in its fresh state under controlled conditions of temperature, time and steam partial pressure so as to initially increase the alpha activity of said catalyst and produce a steamed catalyst having a peak alpha activity, and subsequently reduce the alpha activity from said peak alpa activity to an alpha activity substantially the same as the alpha activity of said fresh catalyst and no more than 25% below the initial alpha activity of said fresh catalyst.

4,812,224

HYDROCRACKING PROCESS

Jeffrey T. Miller, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Nov. 23, 1987, Ser. No. 124,283
Int. Cl.[4] C10G 47/16
U.S. Cl. 208—111 15 Claims

1. A process for the hydrocracking of a feedstock comprising a light catalytic cycle oil having a boiling range from about 350° F. to about 700° F. which comprises reacting the feedstock with hydrogen at hydrocracking conversion conditions in the presence of a catalyst comprising a hydrogenation component comprising a nickel component and a tungsten component wherein the nickel component is present in an amount ranging from about 1 to about 10 wt. % and the tungsten component is present in an amount ranging from about 10 to about 30 wt. %, both calculated as oxides and based on the total catalyst weight and a support component consisting essentially of a crystalline molecular sieve component and an alumina component wherein the crystalline molelcular sieve component is present in the support in an amount less than about 40 wt. % and greater than about 10 wt. % based on the total weight of the support component.

4,812,225

METHOD AND APPARATUS FOR TREATMENT OF OIL CONTAMINATED SLUDGE

Aldo Corti, Calgary, Canada, and John A. Falcon, Milan, Italy, assignors to Gulf Canada Resources Limited and RTR Oil Sands (Alberta) Ltd., both of Calgary, Canada

Filed Feb. 10, 1987, Ser. No. 12,859
Int. Cl.[4] C10G 17/00
U.S. Cl. 208—13 24 Claims

1. A process for treating an oil-containing sludge for recovery of oil-free solids therefrom, said sludge comprising an emulsion having a continuous liquid phase and a dispersed liquid phase, of mutually immiscible liquids, one of said liquids being an aqueous liquid freely miscible with water and the other of said liquids being a hydrocarbon oil, either or both of said liquids containing dispersed inorganic solids, said process comprising the steps of:

(a) in a first, sludge-conditioning stage, preparing a conditioned sludge ready for centrifugation, said conditioned sludge being characterized by a solids content of less than 50% by weight, of wataer content of less than 90% by weight, an oil phase with an API gravity of less than 12°, a continuous aqueous phase, and the solids in the sludge being primarily water-wetted, said preparation being accomplished by addition of the appropriate amount of water, hydrocarbon diluent and conditioning agent to attain said characterization based on the results of predetermination of the characteristics of said oil-containing sludge prior to conditioning, and adjusting the temperature of the conditioned sludge to a temperature slightly below the boiling point of the lowest boiling constituent thereof;

(b) in a second sludge treatment stage, subjecting the conditioned sludge to centrifugation, to separate therefrom a solids-rich material of low hydrocarbon content and an aqueous supernatant liquid of higher hydrocarbon content; and

(c) in a liquid/liquid separation stage, causing the supernatant liquid to separate into an aqueous phase and a hydrocarbon phase.

4,812,226

CATALYTIC CRACKING PROCESS

Regis J. Pellet, Croton-On-Hudson, and Richard J. Hinchey, Thornwood, both of N.Y., assignors to UOP, Des Plains, Ill.

Division of Ser. No. 721,894, Apr. 11, 1985, Pat. No. 4,711,864, which is a continuation of Ser. No. 506,446, Jun. 2, 1983, abandoned. This application Oct. 7, 1987, Ser. No. 105,218
Int. Cl.[4] B01J 29/08
U.S. Cl. 208—120 13 Claims

1. The process for cracking a hydrocarbon feedstock to produce lower boiling hydrocarbons which comprises contacting said hydrocarbon feedstock under catalytic cracking conditions with a catalyst comprising a zeolitic aluminosilicate which has a mole ratio of oxides in the dehydrated state of

$$(0.85\text{–}1.1)M_{2/n}O:Al_2O_3:xSiO_2$$

wherein M is a cation having a valence of "n": x has a value greater than 6.0; the aluminosilicate has an x-ray powder diffraction pattern having at least the d-spacings of Table A, has extraneous silicon atoms in the crystal lattice in the form of framework SiO_4 tetrahedra; and said zeolitic aluminosilicate has been ion-exchanged to contain at least one Group III A cation per unit cell.

4,812,227

HYDROTREATING WITH CATALYSTS COMPRISING MIXTURES OF AN AMORPHOUS SULFIDE OR TRIVALENT CHROMIUM AND MICROCRYSTALLITES OF MOLYBDENUM SULFIDE OR TUNGSTEN SULFIDE

Allan J. Jacobson, Princeton; Teh C. Ho, Bridgewater; Russell R. Chianelli, Somerville; John J. Steger, Pittstown, and Angelo A. Montagna, Summit, all of N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 656,145, Sep. 28, 1984, abandoned, Continuation-in-part of Ser. No. 567,882, Jan. 3, 1984, abandoned, which is a continuation of Ser. No. 454,384, Dec. 29, 1982, abandoned. This application Apr. 23, 1986, Ser. No. 858,529
Int. Cl.[4] C10G 45/08
U.S. Cl. 208—215 26 Claims

1. A process for hydrorefining a hydrocarbon feed to reduce the contents of nitrogen compounds and sulfur compounds in said feed which comprises contacting said feed at an elevated temperature of at least about 150° C. and in the presence of hydrogen with a catalyst consisting essentially of a mixture of (i) an amorphous sulfide of trivalent chromium and (ii) microcrystallites of a metal sulfide of a metal selected from the group consisting of Mo, W and mixture thereof, said contacting occurring for a time sufficient to hydrorefine at least a portion of said feed.

23. A process for improving the oxidation stability of a

nitrogen and sulfur containing lube oil feed which comprises contacting said feed at an elevated temperature of at least about 150° C. and in the presence of hydrogen with a catalyst consisting essentially of a mixture of (i) an amorphous sulfide of trivalent chromium and (ii) microcrystallites of metal sulfides of a metal selected from the group consisting of Mo, W and mixture thereof, said contacting occurring for a time sufficient to improve the oxidation stability of said lube oil feed.

4,812,228

PROCESS FOR HYDROTREATING RESIDUAL PETROLEUM OIL

Philip J. Angevine, West Deptford, N.J.; Thomas F. Degnan, Jr., Yardley, Pa., and Michael E. Landis, Woodbury, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 774,520, Sep. 10, 1985, Pat. No. 4,600,503, which is a continuation-in-part of Ser. No. 687,414, Dec. 28, 1984, abandoned. This application Jul. 14, 1986, Ser. No. 884,934

The portion of the term of this patent subsequent to Jul. 15, 2003, has been disclaimed.

Int. Cl.[4] C10G *17/00, 45/00*

U.S. Cl. 208—251 H **19 Claims**

1. A method for hydrotreating residual oil which comprises contacting said oil with a hydrotreating catalyst which contains a thermally stable composition comprising a layered metal oxide containing an interspathic polymeric oxide having a d-spacing of at least about 10 angstroms at hydrotreating conditions which include a temperature ranging from about 357° to 454° C. (675° F. to 850° F.), a hydrogen partial pressure of at least about 2860 kPa (400 psig) and a liquid hourly space velocity ranging between about 0.1 and 10 hr^{-1}, wherein said layered metal oxide is a layered silicate selected from the group consisting of magadiite, natrosilite, kenyaite, makatite and kanemite.

4,812,229

SCREEN CAGE

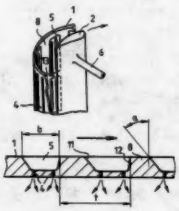
Josef Tra, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Mar. 5, 1987, Ser. No. 22,264

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1986, 3607457

Int. Cl.[4] B07B *1/46*

U.S. Cl. 209—397 **8 Claims**



1. A rotationally symmetric cage screen for screening fiber suspenson, which fiber suspension has a flow direction generally tangential to said cage screen, said cage screen having an influx side and a cage surface generatrix, said cage screen comprising:

a plurality of depressions at small intervals on said influx side, each of said depressions having a depression width, each of said depressions having a base and a front lateral surface inclined at an angle between about 15° and 60° from a line normal to said cage surface generatrix and extending from the base in a direction contrary to the flow direction;

a plurality of slits provided in said screen at an angel between about 0° and 35° from said cage surface generatrix, at least two of said plurality of slits provided in each of said plurality of depressions and arranged successively in the flow direction, each of said plurality of slits having a slit width; and,

said depression width being at least ten times said slit width.

4,812,230

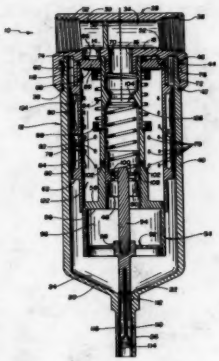
FLUID FILTER

Benedict R. Gerulis, Blaine, Minn., assignor to C.I.B., Inc., Minneapolis, Minn.

Filed Feb. 26, 1988, Ser. No. 160,652

Int. Cl.[4] B01D *27/12*

U.S. Cl. 210—108 **5 Claims**



1. A self-cleaning fluid filter, comprising:

(a) a housing having spaced inlet and outlet ports in a common wall thereof for ingress and egress, respectively, of a pressurized fluid;

(b) a first sleeve, extending from said common wall along an axis of said housing, wherein an interior chamber of said first sleeve is in fluid communication with said outlet port, said first sleeve having a narrowed portion proximate said outlet port and an expanded portion remote from said outlet port, said narrowed portion of said first sleeve having at least one orifice formed therein;

(c) a second sleeve extending from said common wall and generally concentrically encircling a portion of said narrowed portion of said first sleeve to define a generally annular space in fluid communication with said inlet port therebetween, said second sleeve having a distal end spaced axially from said expanded portion of said first sleeve;

(d) a generally cylindrical filter cartridge encircling said expanded portion of said first sleeve and being disposed for telescoping movement, in response to pressurized fluid flow through said inlet port, relative to said expanded portion of said first sleeve, between a primary position, wherein a piston carried by a first end of said filter cartridge is received within, and occludes, said annular space, and a secondary position, wherein said piston is outside said annular space and axially intermediate said distal end of said second sleeve and said at least one orifice formed in said narrowed portion of said first sleeve;

(e) means for normally biasing said filter cartridge to said primary position thereof;

(f) a valve member received within said narrowed portion of said first sleeve and disposed for telescoping movement relative thereto between a primary position, wherein said at least one orifice formed in said narrowed portion of said first sleeve is occluded, and a secondary position, spaced axially from said primary position wherein said at least

one orifice formed in said narrowed portion of said first sleeve is unobstructed; and

(g) means, responsive to movement of said filter cartridge, for urging said valve member from said primary position thereof to said secondary position thereof as fluid flow is introduced through said inlet port to urge said filter cartridge from said primary position thereof to said secondary position thereof, and for urging said valve member from said secondary position thereof to said primary position thereof as fluid flow through said inlet port is discontinued to allow said filter cartridge biasing means to urge said filter cartridge from said secondary position thereof to said primary position thereof.

4,812,231

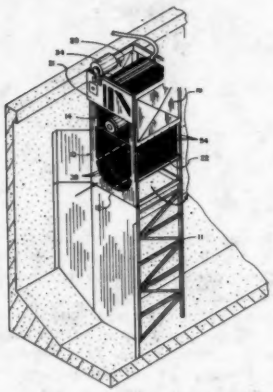
SELF CLEANING ROTATING FINE POLISHING FILTER SCREEN APPARATUS

Bruce O. Wiesemann, South Pasadena, Fla., assignor to Wiseman Enterprises, Inc., Largo, Fla.

Filed Aug. 17, 1988, Ser. No. 233,290

Int. Cl.[4] B01D *33/04*

U.S. Cl. 210—158 9 Claims



1. In an apparatus for removing fine particles from a water effluent using a drum type housing with a continuously rotating screen assembly moving in an eliptical path around a drum chamber receiving the water effluent and a flushing system on a top surface of the drum housing to carry away debris entrapped by the screen assembly, the improvement comprising,

(a) the screen assembly having multiple endless loop filter sections, each section having a series of spaced apart adjacent loops, the loops containing end-to-end longitudinally mounted links, each link connected to another link by a horizontally mounted link connecting rod;

(b) each filter section capped at each side by a gear tooth engaging pivot member, the pivot member having at least two lateral through bores to accommodate one of the horizontally mounted link connecting rods in each bore;

(c) the pivot member having a flat bottom surface distal from a center of the drum chamber, a top surface having a valley intermediate a first and second end to accommodate a gear tooth, a first and second side surface having a cut out portion on the first end of the first side and a cut out portion on the second end of the second side to accommodate a matching cut out portion from a pivot member mounted end-to-end on the link connecting rod;

(d) each link in the screen assembly having a width of less than 0.06 millimeters so that algae and other clumped microscopic debris will become entrapped between the links and washed off the links by the flushing system and

(e) means for conveying debris to waste disposal.

4,812,232

APPARATUS FOR DECREASING THE ALCOHOL CONTENT OF ALCOHOL-CONTAINING BEVERAGES, PARTICULARLY WINE AND SPARKLING WINE

Manfred Weiss, Hinter den Zäunen 16, D-6229 Kiedrich, Fed. Rep. of Germany

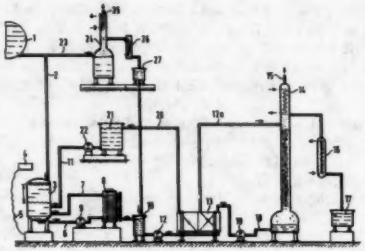
Division of Ser. No. 718,952, Apr. 2, 1985, Pat. No. 4,681,767.

This application Mar. 2, 1987, Ser. No. 20,570

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1984, 3413085

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—181 5 Claims



1. In apparatus for decreasing the alcohol content of alcohol-containing beverages including reverse osmosis means for subjecting a beverage, initially containing alcohol, to reverse osmosis thereby to produce a dealcoholized beverage and an alcohol-containing permeate, and means for refeeding at least aromatic substances to said dealcoholized beverage, the improvement which comprises:

(a) first vacuum distillation means (14), receiving said permeate from said reverse osmosis means (8), for distilling said permeate ot obtain therefrom alcohol-free permeate water;

(b) means (18, 20, 19, 21, 22, 11) for feeding said permeate water from said first vacuum distillation means to the beverage subjected to reverse osmosis; and

(c) second vacuum distillation means (24) for obtaining water from a beverage for feeding, in addition to said permeate water, into the beverage subjected to reverse osmosis to maintain a predetermined volume of the last-mentioned beverage.

4,812,233

APPARATUS FOR SEPARATING A SOLID SUBSTANCE FROM A LIQUID MIXTURE OF SUBSTANCES

Hubert Coenen, Essen; Rainer Hagen, Berlin, and Klaus Reimann, Essen, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Fed. Rep. of Germany

Filed Oct. 15, 1986, Ser. No. 919,295

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1985, 3536622

Int. Cl.[4] B01D *11/04*

U.S. Cl. 210—177 4 Claims

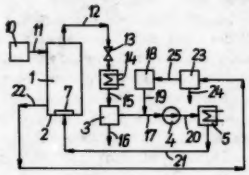
1. Apparatus for recovering a powder by separating a dissolved solid substance from a liquid mixture of substances by countercurrent extraction in an extraction chamber with a solvent in the liquid or supercritical state to form a solvent phase which is loaded with the liquid substances and an extraction phase comprising said solid substance and solvent, the apparatus comprising:

means for introducting said liquid mixture into said extraction chamber, means for recovering said solvent phase from said extraction chamber, means for recovering said extraction phase from said extraction chamber, means for separating said solid substance in powder form from said solvent, at least one separator connected to the extraction

chamber for separating the solvent from the liquid substances, means for returning the separated solvent to the extraction chamber,

a cylindrical pressure-resistant countercurrent extraction chamber which does not have any internal components and which has a diameter-height ratio of 1:5 to 1:10, and,

nozzle means arranged directly at the bottom of the extraction chamber for supplying solvent to the extraction



chamber, the nozzle means being in the form of bores and forming an angle of 0° to 60° with the axis of the extraction chamber, the nozzle means being selected in a number and bore-width to control the flow of solvent through the extraction chamber so that the solvent leaves the nozzle means with a Reynolds number of greater than 40,000, and flows upward through the extraction chamber with a Reynold's number of 2,700 to 8,000.

4,812,234

OIL SLUDGE CONDITIONING EQUIPMENT

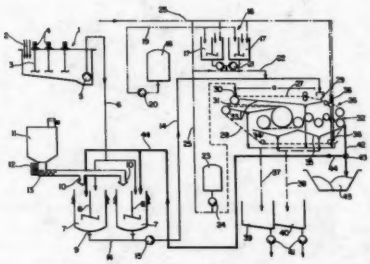
Heinz Perchthaler, and Stamatios Stefou, both of Graz, Austria, assignors to Maschinenfabrik Andritz Actiengesellschaft, Graz, Austria

Continuation of Ser. No. 520,014, Aug. 3, 1983, abandoned. This application Jul. 25, 1985, Ser. No. 759,124

Claims priority, application Austria, Mar. 26, 1981, 1403/81

Int. Cl.[4] B01D *33/04*

U.S. Cl. 210—195.3 **4 Claims**



1. Apparatus for conditioning oil sludges with a horizontally arranged double wire cloth press, in which said horizontally arranged double wire cloth press is used as a separation device forming a pressed cake, including a sludge basin and agitator means mounted within said sludge basin wherein mixing of individual sludges takes place and from which a suspension is removed, and including intermediate stages for additions assuring the dehydration procedure, sludge pump means for conveying the suspension into an agitation vessel with metering means, metering means and conveying means for adding solid filtering aid means to the suspension in said agitation vessel, a flocculation dissolving station, sludge metering pump means for moving the suspension together with added organic flocculants prepared in said flocculation dissolving station into the horizontally arranged double wire cloth press, a horizontally arranged feed zone in said wire cloth press effecting gravity pre-dehydration of said suspension, means for feeding said suspension mixed with solid filtering aid means and with added organic flocculants at the beginning of said feed zone, and means for feeding a metal salt to said suspension at the end of said feed zone following said pre-dehydration.

4,812,235

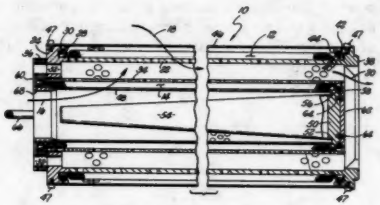
FILTER ELEMENT ASSEMBLY REPLACEABLE MESH PACK

Don J. Seleman, Granada Hills, and Roy F. Honzik, Sepulveda, both of Calif., assignors to HR Textron, Inc., Valencia, Calif.

Continuation of Ser. No. 362,804, Mar. 29, 1982, abandoned. This application Sep. 26, 1983, Ser. No. 539,221

Int. Cl.[4] B01D *29/26*

U.S. Cl. 210—247 **9 Claims**



1. A dual metallic filter element for filtering materials having a viscosity in excess of about 200 poise at temperatures in excess of about 100° C. and pressures in excess of approximately 400 p.s.i. and having dual replaceable spaced apart filter media, said material being filtered by flowing through each of said media from one side thereof, the upstream side, to another side thereof, the downstream side, comprising:

(A) outer stainless steel metal filter media perforate support tube means;

(B) outer stainless steel metal filter media perforate tubular guard shield means;

(C) first tubular stainless steel metal filter media disposed between said outer tube and shield means;

(D) inner stainless steel metal filter media perforate support tube means;

(E) inner stainless steel metal filter media perforate tubular guard shield means;

(F) second tubular stainless steel metal filter media disposed between said inner tube and shield means;

(G) said first filter media being concentrically disposed outwardly relative said second filter media and defining an inner tubular volume surrounded by an annular outer void volume, said volumes having adjacent first ends and adjacent seconds end; and

(H) retaining means including cap means and fitting means removably securing each said filter media on its respective support tube means and plugging said first end of said tubular volume and said second end of said annular void volume respectively, said support tube means being disposed opposed each other, defining said annular outer void volume, and being on the downstream side of the flow of said material through each said filter media.

4,812,236

METAL MICROFILTER

Christian Ehrsam, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Oct. 16, 1987, Ser. No. 109,222

Claims priority, application Switzerland, Oct. 23, 1986, 4226/86

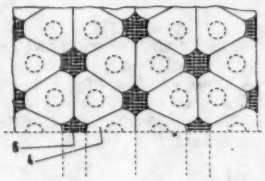
Int. Cl.[4] B01D *25/00*

U.S. Cl. 210—490 **20 Claims**

1. A filter comprising

a metal microfilter foil having micropores therein; and

an electroplated open-pore supporting structure supporting said foil and having pores of larger size than said micropores, said supporting structure including a first porous



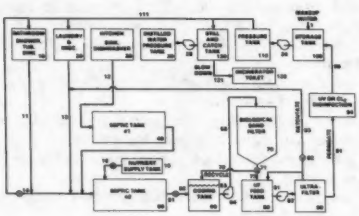
layer of individual connecting elements connected to said foil and a second porous layer connected to said elements of said first layer and having a continuous structure with open macropores.

4,812,237

WATER RECYCLE SYSTEM

William E. Cawley, Richland, Wash., and Basil W. Mercer, Harrison, Id., assignors to Bio Tech, Inc., Richland, Wash.

Filed Dec. 21, 1987, Ser. No. 135,696
Int. Cl.[4] C02F *3/30*
U.S. Cl. 210—605 9 Claims



1. A process for purifying and recycling household waste waters comprising the following steps:

(a) collecting a first wastewater stream from household kitchen sources;

(b) anaerobically digesting said first wastewater stream in a first septic tank;

(c) collecting a second wastewater stream from household laundry and bathing sources;

(d) combining water from steps (b), (c), and (h);

(e) anaerobically digesting water from step (d) in a second septic tank;

(f) pumping water from step (e) over a biological sand filter under aerobic conditions;

(g) pumping biologically filtered water from step (f) through an ultrafilter thereby separating the biologically filtered water into a retentate stream and a permeate stream;

(h) returning said retentate stream to step (d);

(i) disinfecting said permeate stream;

(j) returning a first portion of said disinfected permeate stream to household laundry and bathing facilities;

(k) separating a second portion of said disinfected permeate stream into a low salt portion and a high salt portion;

(l) returning said low salt portion to a household kitchen; and

(m) disposing of said high salt portion.

4,812,238

MEMBRANES PREPARED VIA REACTION OF DIAZONIUM COMPOUNDS OR PRECURSORS

John E. Cadotte, Minnetonka, Minn., and Donald L. Schmidt, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich. and Filmtec Corp., Minneapolis, Minn.

Continuation-in-part of Ser. No. 3,996, Jan. 15, 1987. This application Aug. 10, 1987, Ser. No. 83,134
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—636 20 Claims

1. A semi-permeable membrane comprising a discriminating layer derived from a polymer including an average of at least one primary amine group or salt thereof and at least one group reactive with a diazonium salt by reacting the polymer with a diazonium salt or precursor of a diazonium salt.

2. The membrane as described in claim 1 wherein the membrane is a composite reverse osmosis membrane and the polymer is a polyamide derived from reactants comprising (a) a compound or polymer bearing an average of at least two primary amine groups and (b) a compound or polymer bearing an average of at least two carboxylic acid halide groups and the polyamide bears a plurality of residual aromatic amine groups.

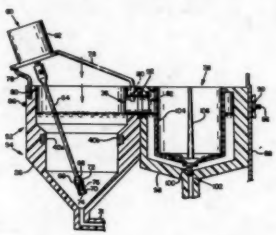
20. In a process for separating water from a mixture or solution using a reverse osmosis membrane having a polyamide discriminating layer, wherein the improvement comprises using a membrane as described in claim 2.

4,812,239

DRY CHEMICAL MIX SYSTEM FOR HEMODIALYSIS

Gary N. Mills, Gladstone, and Charles B. Willock, Milwaukie, both of Oreg., assignors to CD Medical Inc., Miami Lakes, Fla.

Filed May 15, 1987, Ser. No. 51,054
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—647 5 Claims



1. A method for providing dialysate solution to a hemodialysis apparatus comprising the steps:

introducing a dry chemical dialysate mix to a dissolution vessel at a substantially constant rate;

introducing a fluid to the dissolution vessel at a substantially constant rate;

facilitating the dissolution of the dry chemical dialysate mix into the fluid in the dissolution vessel;

detecting a physical characteristic of the dissolved solution and producing an output signal corresponding thereto;

providing a reference signal corresponding to a desired value of the physical characteristic;

comparing the output signal with the reference signal and producing a control signal corresponding thereto;

adjusting the rate at which the dry chemical dialysate mix or the fluid is introduced to the dissolution vessel in response to said control signal so as to regulate the detected physical characteristic of the dissolved solution substantially to the desired value; and

continuously removing dissolved solution for supply to the hemodialysis apparatus.

4,812,240

PROCESS FOR TREATING WASTE WATER CONTAMINATED WITH MANGANESE

Lawrence E. Watts, Quakertown, Pa., assignor to Quaker Chemical Corporation, Conshohocken, Pa.

Filed Aug. 5, 1988, Ser. No. 228,996
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—639 6 Claims

1. A process for treating wastewater containing from about 0.2 ppm to about 20 ppm manganese (II) ion comprising the steps of:

(a) adding to said wastewater an amount of a water-soluble lignosulfonate salt sufficient to form a manganese (II) ion-lignosulfonate complex to provide a manganese (II) ion-lignosulfonate wastewater mixture;

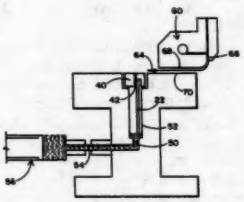
(b) separating said manganese (II) ion-lignosulfonate complex from said mixture by passing said mixture through an ultrafilter, said ultrafilter including a semi-permeable membrane having a pore size effective to prevent the passage of said manganese (II) ion-lignosulfonate complex through said membrane to provide a permeate containing less than 0.2 ppm manganese (II) ion.

4,812,241

SAMPLE TRANSFER FOR INFRARED ANALYSIS IN THIN LAYER CHROMATOGRAPHY-STRUCTURE & METHOD

Kenneth H. Shafer, Costa Mesa, Calif., assignor to Laser Precision Corporation, Irvine, Calif.

Continuation-in-part of Ser. No. 85,403, Aug. 14, 1987, abandoned. This application May 23, 1988, Ser. No. 197,702
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—658 29 Claims



1. A sample transfer system for moving fractions from a thin layer chromatography plate to a diffuse reflectance spectrometer accessory, comprising:

a chamber in which the transfer occurs;

a thin layer chromatography plate in the chamber, so located that its separated fractions are spaced horizontally from one another;

an amount of solvent in the chamber into which the lower edge of the plate extends;

a plurality of horizontally-spaced wicks engaging the upper edge of the plate, each of said wicks being formed of fused powdered metal which is essentially chemically inert;

a plurality of horizontally-spaced receptacles each engaging the upper end of one of the wicks, and each containing powdered material which is transparent to analytical radiation;

the arrangement being such that capillary action moves solvent upwardly to dissolve material in a separated fraction on the plate, and then carry it upwardly through a wick to a receptacle; and

an airflow means for evaporating the solvent while retaining the material of the separated fraction in its receptacle.

4,812,242

METHOD OF ENCAPSULATING ORGANIC MATERIAL

Keith James, Carshalton, and Graham M. Pring, Woking, both of England, assignors to The British Petroleum Company p.l.c., London, England

Continuation of Ser. No. 736,338, May 21, 1985, abandoned. This application Aug. 21, 1987, Ser. No. 88,990
Claims priority, application United Kingdom, May 31, 1984, 8413911
Int. Cl.[4] C02F *1/40*
U.S. Cl. 210—735 12 Claims

1. A method of encapsulating organic material which is floating on, or in admixture with, water which method comprises reacting in the presence of the organic material and water (A) a functionalised liquid polymer containing anhydride functional groups which functional groups are derived from an alpha, beta-ethylenically unsaturated dicarboxylic acid anhydride and (B) a crosslinking agent, the functionalised polymer and a crosslinking agent being miscible with the organic material and capable of crosslinking to form a three-dimensional polymer network containing encapsulated organic material, and allowing a three-dimensional polymer network to form, wherein the crosslinking agent comprises an alkoxylated fatty amine selected from the group consisting of

(a) an alkoxylated fatty monoamine having from 1.5 to 10 moles of alkoxylate per mole of fatty monoamine, the major proportion of alkoxylate groups being selected from ethoxylate and propoxylate groups and the alkoxylated fatty monoamine being derived from a fatty amine having an iodine value of at least 45,

(b) an alkoxylate fatty polyamine having from 2.5 to 15 moles of alkoxylate per mole of fatty polyamine, the major proportion of alkoxylate groups being selected from ethoxylate and propoxylate groups and the alkoxylated fatty polyamine being derived from a fatty amine having an iodine value of at least 45,

(c) an alkoxylated fatty monoamine having from 1.5 to 10 moles of alkoxylate per mole of fatty monoamine, the major proportion of the alkoxylate groups having at least four carbon atoms and the alkoxylated fatty monoamine being derived from a fatty amine having an iodine value of at least 10 and

(d) an alkoxylated fatty polyamine having from 2.5 to 15 moles of alkoxylate per mole of fatty monoamine, the major proportion of the alkoxylate groups having at least 4 carbon atoms and the alkoxylated fatty polyamine being derived from a fatty amine having an iodine value of at least 10.

4,812,243

PROCESS FOR TREATING CAUSTIC CYANIDE METAL WASTES

Bruce L. Brandenburg, Rib Mountain; Curtis D. Cooley, Rothschild, both of Wis., and Claude E. Ellis, Walnut, Calif., assignors to Zimpro/Passavant Inc., Rothschild, Wis.

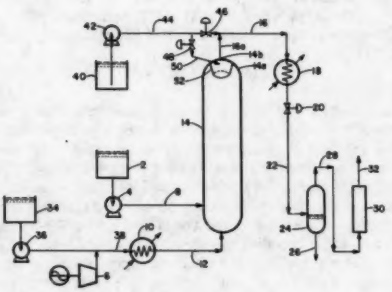
Filed Oct. 6, 1988, Ser. No. 254,070
Int. Cl.[4] C02F *1/74, 11/08*
U.S. Cl. 210—761 13 Claims

1. In a process for treating by wet oxidation a caustic cyanide and metal wastewater showing a potential to form scale upon heating, wherein said raw wastewater is introduced by a first inlet conduit into a pressurized wet oxidation reactor without preheating, and wherein a preheated mixture of oxygen containing gas and dilution water is introduced by a second inlet conduit into said reactor, and wherein said wastewater, dilution water and oxygen containing gas are maintained within said reactor at an elevated temperature and pressure for sufficient time to destroy cyanide and produce an oxidized waste effluent and an oxygen depleted offgas which are removed from said reactor, wherein the improvement comprises the steps;

(a) discharging said oxidized effluent and offgas from said reactor through a first effluent conduit while at the same

time introducing a dilute mineral acid solution into said reactor through a second effluent conduit to prevent scale and solids buildup therein; and

(b) alternating the flow of oxidized effluent and offgas and



dilute mineral acid whereby oxidized effluent and offgas discharge from the reactor through said second effluent conduit and dilute mineral acid solution enters the reactor through said first effluent conduit to remove scale and solids therefrom.

4,812,244

WELL DRILLING FLUIDS AND PROCESS FOR DRILLING WELLS

Horace F. Lawson, Downington, Pa., and Arthur H. Hale, Sand Springs, Okla., assignors to Pony Industries, Inc., New York, N.Y.

Continuation of Ser. No. 808,714, Dec. 13, 1985, abandoned. This application Sep. 24, 1987, Ser. No. 100,460

Int. Cl.[4] C09K *7/02*

U.S. Cl. 252—8.514 **8 Claims**

1. A composition comprised of

(a) an aqueous base,

(b) a clayey material suspended in said aqueous base,

(c) a water-soluble sulfonated styrene-maleimide copolymer having a molecular weight of about 500 to about 15,000,

(d) a water-soluble copolymer having a molecular weight of about 500 to about 30,000 prepared from alkali metal salts of acrylic acid and methacrylic acid,

the combined total weight of the polymers of (c) and (d) present in the composition being in the range of about 0.05 to about 10.0 pounds per barrel of composition and the weight ratio of the polymer of (c) to the polymer of (d) being in the range of about 90:10 to about 5:95.

4,812,245

INTERCALATIONS OF CRYSTALLINE LITHIUM ALUMINATES

John L. Burba, III, Angleton, Tex., and William C. Bauman, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 619,427, Jun. 11, 1984, abandoned. This application Apr. 14, 1986, Ser. No. 851,598

The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.

Int. Cl.[4] C10M *113/08, 117/02, 117/06, 117/08*

U.S. Cl. 252—17 **24 Claims**

1. A composition comprising a mineral oil having uniformly admixed therewith a thickener comprising at least one compound selected from those which conform to the empirical crystal formula

$$(LiA_x)_y.2Al(OH)_3.nH_2O$$

where A represents one or more monovalent or multivalent anions and/or negative-valence radicals or mixtures thereof,

where x represents a quantity of A ions or radicals sufficient to substantially satisfy the valence requirements of Li,

where n represents zero or the number of waters of hydration, and

where y is a numerical value at least sufficient to maintain the crystalline structure.

4,812,246

BASE OIL FOR LUBRICATING OIL AND LUBRICATING OIL COMPOSITION CONTAINING SAID BASE OIL

Takao Yabe, Ichihara, Japan, assignor to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1988, Ser. No. 160,027

Claims priority, application Japan, Mar. 12, 1987, 62-55310; Mar. 12, 1987, 62-55311

Int. Cl.[4] C10M *137/06*

U.S. Cl. 252—32.7 E **17 Claims**

1. A base oil for lubricating oil, having a kinematic viscosity as determined at 100° C. of 2 to 50 cSt, an aromatic content of not more than 2%, a viscosity index of at least 75, a pour point not more than −10° C., and a sulfur content of not more than 100 ppm.

4,812,247

PLASTICS MOULDING CONTAINING REINFORCED FILLINGS

Karsten Fahner, Cologne; Friedrich Johannaber, Lohmar; Hans-Werner Depcik, Duesseldorf; Axel Kaminski, Wermelskirchen, and Rüdiger Van Hooren, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Continuation of Ser. No. 601,440, Apr. 18, 1984, abandoned. This application Aug. 11, 1986, Ser. No. 895,164

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1983, 3315707

Int. Cl.[4] A01B *1/06*

U.S. Cl. 252—511 **3 Claims**

1. An injection molded plastic article containing solid fillings which consist essentially of lubricate-free fillings wherein more than 30% by weight of which have a minimum length of greater than 4 mm said fillings selected from the group consisting of carbon, aramide, asbestos, metal, glass and mineral fibers and said plastic article being produced by a process in which lubricant-free fillings are introduced into a screw in an injection molding apparatus in a region, where the plastic is in a plasticized form and the pressures are nearly the same, and are then incorporated by shearing, characterized in that shearing of the fillings of fiber-like, thread-like, ribbon-like or sheet-form materials and their incorporation into the plastic is intensified by a piston-like movement of the screw, after which the plastic is injected into a closed mold by means of a piston.

4,812,248

LUBRICATING COMPOSITION AND METHOD

William F. Marwick, Byfield, England, assignor to Alcan International Limited, Montreal, Canada

Filed Dec. 2, 1986, Ser. No. 937,042

Claims priority, application United Kingdom, Dec. 6, 1985, 8530146

Int. Cl.[4] C10M *129/76*

U.S. Cl. 252—56 R **6 Claims**

1. A lubricating composition for press forming consisting of a lubricant dissolved or dispersed in a volatile liquid medium, wherein the lubricant comprises at least one ester of a polyhydric alcohol having two or three hydroxyl groups of which one or two are esterified with a long chain carboxylic acid, wherein the lubricant includes at least one ester having a free hydroxyl group, said lubricant having a melting point above ambient temperature but low enough to permit removal from a metal surface by an aqueous alkaline cleaner.

4,812,249

TESTING SYSTEM

Isabelle Y. Duminy-Kovarik, Malta, Ill., assignor to Circle Chemical Company, Inc., Hinckley, Ill.

Division of Ser. No. 908,251, Sep. 17, 1986, Pat. No. 4,701,275.
This application Jul. 10, 1987, Ser. No. 71,883
Int. Cl.[4] C04B *35/00*
U.S. Cl. 252—62.52 19 Claims

1. A method of conditioning water as a vehicle for magnetic testing powders by forming a composition using the following steps:

(a) lowering an aqueous surface tension of said water to below 30 dynes per centimeter by adding a wetting agent to said composition;

(b) increasing an aqueous viscosity above 1.3 centipoises but below 3.0 centipoises by adding to said water at least one component selected from the group consisting of an ethoxylated lauryl alcohol sulfate and an ethoxylated lauryl alcohol phosphate to form said composition;

(c) buffering said composition between a pH of 7 and 10;

(d) inhibiting aqueous corrosion of ferrous surfaces by adding a polyamine borate to said composition; and

(e) limiting foam in said composition by adding an antifoaming agent to said composition.

4,812,250

WORKING FLUID MIXTURES FOR USE IN THERMODYNAMIC COMPRESSION CYCLES COMPRISING TRIFLUOROMETHANE AND CHLORODIFLUOROETHANE

Jean-Louis Ambrosino, Suresnes; Choua Cohen, Lyons; Jacques Cheron, Maisons Laffitte, and Alexandre Rouey, Garches, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Nov. 23, 1987, Ser. No. 124,144
Claims priority, application France, Nov. 21, 1986, 86 16363
Int. Cl.[4] C09K *5/04*
U.S. Cl. 252—67 9 Claims

1. A non-azeotropic fluid mixture for use in compression thermodynamic cycles, characterized in that it comprises:

(α) trifluoromethane (fluid (a)),

(β) 1-chloro 1,1-difluoroethane (fluid (b)), and

(γ) optionally at least one fluid (c) different from fluid (a) and from fluid (b), selected from the group formed of methane and ethane halogenated compounds having a boiling temperature under atmospheric pressure from about −85° C. to about +60° C., the molar proportions of said fluids in the non-azeotropic mixture being such the a/b molar ratio ranges from 0.01:1 to 1.10:1 and the (a+b)/(a+b+c) molar ratio ranges from 0.26:1 to 1:1.

4,812,251

ELECTRO-RHEOLOGICAL FLUIDS/ELECTRIC FIELD RESPONSIVE FLUIDS

James E. Stangroom, Sheffield, Great Britain, assignor to ER Fluid Developments Limited, Sheffield, England

Filed Mar. 16, 1988, Ser. No. 168,664
Claims priority, application United Kingdom, Mar. 24, 1987, 8706928
Int. Cl.[4] C09R *3/00*; C10M *107/50*
U.S. Cl. 252—75 19 Claims

1. An electro-rheological fluid comprising a hydrophilic solid and a hydrophobic liquid component wherein said hydrophobic liquid component comprises a fluorosilicone whose average molecular weight is in the range 200–700.

4,812,252

DETERGENT COMPOSITION

Mayara E. N. Nambudiry, Maharashtra, India, assignor to Lever Brothers Company, New York, N.Y.

Filed May 3, 1988, Ser. No. 189,577
Claims priority, application India, Mar. 20, 1987, 91/BOM/87; United Kingdom, May 6, 1987, 8710689
Int. Cl.[4] C11D *9/00, 9/26*
U.S. Cl. 252—108 9 Claims

1. A soap-based detergent composition comprising water soluble salts of monocarboxylic acids having 8 to 22 carbon atoms characterised in that the composition contains from about 1 wt % to about 20 wt % of a water soluble organic salt of formula

$$R_1—O—(CR_2R_3)_n—CO_2M$$

wherein

R_1 is alkyl, alkenyl or alkynyl having 4 to 12 carbon atoms,

R_2 with respect to each occurrence are the same or different and are selected from H, alkyl and alkenyl groups,

R_3 with respect to each occurrence are the same or different and are selected from H, alkyl and alkenyl groups,

n is 2,3 or 4, and

M is a cation providing water soluble properties.

4,812,253

ULTRA MILD SKIN CLEANSING COMPOSITION

Leonard E. Small; Paul H. Garrison, Jr.; William M. Winkler, all of Cincinnati; Sharon A. Seaman, Milford, and Alyce J. Papa, Wyoming, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 733,670, May 13, 1985, Pat. No. 4,673,525. This application Jun. 15, 1987, Ser. No. 62,258
The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.
Int. Cl.[4] C11D *9/02, 9/60*
U.S. Cl. 252—132 27 Claims

1. An ultra mild skin cleansing toilet bar composition consisting essentially of:

A. 20–70% mild synthetic surfactant;

B. 10–40% moisturizer;

C. 0.1–5% polymeric skin mildness aid, and

D. 5.5–25% soap;

wherein said synthetic surfactant and said soap have a ratio of from 2:1 to 12:1; and

wherein said moisturizer to soap have a ratio of from 1:1 to 7:1; and

wherein said mild surfactant is selected from the group consisting of:

alkyl glyceryl ether sulfonate (AGS);
anionic acyl sarcosinates;
methyl acyl taurates;
N-acyl glutamates;
alkyl glucosides;
acyl isethionates;
alkyl surlosuccinate;
alkyl phosphate ester;
alkyl ether sulfate;
ethoxylated alkyl phosphate esters;
methyl glucose esters;
protein condensates;
mixtures of ethoxylated alkyl sulfates and alkyl amine oxides;
betaines;
sultaines; and
mixtures thereof; and

wherein said mild synthetic surfactant contains at least one surfactant selected from mild anionic or mild amphoteric surfactants; and

wherein said composition cleanses with reduced skin dryness; and wherein said composition has improved lather due to said polymer and soap.

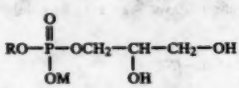
4,812,254

DETERGENT COMPOSITION

Junya Wakatsuki, Utsunomiya; Tomohiko Sano, Narashino, and Tomihiro Kurosaki, Osaka, all of Japan, assignors to Kao Corporation, Tokyo, Japan

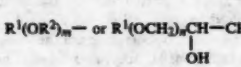
Filed Feb. 12, 1988, Ser. No. 155,291
Claims priority, application Japan, Feb. 20, 1987, 62-37226
Int. Cl.[4] C11D *1/88*
U.S. Cl. 252—135 3 Claims

1. A detergent composition comprising 2-90 wt. % of a compound represented by the following formula (I):



(I)

wherein R means



R^1 denotes a straight-chain or branched alkyl or alkenyl group having 1-36 carbon atoms, wherein one or more hydrogen atoms of the alkyl or alkenyl group may optionally be substituted with the corresponding number of fluorine atoms, or R^1 denotes a phenyl group substituted by a straight-chain or branched alkyl group having 1-15 carbon atoms, R^2 is an alkylene group having 2-3 carbon atoms, m is 0-30, n stands for 0 or 1, and M means a hydrogen atom or denotes an alkali metal, alkaline earth metal, zinc or aluminum atom, an ammonium ion, or an alkylamine or alkanolamine residuum thereby to indicate the formation of a salt of the compound of the formula (I).

4,812,255

PAINT REMOVING COMPOSITIONS

David W. Suwala, Flanders, N.J., assignor to GAF Corporation, Wayne, N.J.

Filed Mar. 4, 1987, Ser. No. 21,891
Int. Cl.[4] C11D *3/28*
U.S. Cl. 252—142 12 Claims

1. A method for removing uncured paint from a substrate comprising

(1) applying to said substrate in glon liquid form a paint removing effective amount of a water-soluble composition consisting essentially of

(a) an organic acid having the formula RCOOH wherein R is hydrogen, lower alkyl having from 1 to 10 carbon atoms, halogen substituted lower alkyl having from 1 to 10 carbon atoms, hydroxy and cyclic alkyl having from 4 to 6 carbon atoms, and alkali metal salts of said acids;

(b) an alkylene glycol ether; and

(c) a five member ring lactone or lactam; and then

(2) washing the substrate with water to remove said composition and aint from the substrate.

4,812,256

AZEOTROPIC COMPOSITIONS OF 1,1-DIFLUORO-1,2,2-TRICHLOROETHANE AND METHANOL, ETHANOL, ISOPROPANOL OR N-PROPANOL

Abid N. Merchant, Wilmington, Del.; Kenneth C. Burke, Westfield, N.J., and Jill M. Redenbaugh, Winston-Salem, N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 20, 1988, Ser. No. 183,989
Int. Cl.[4] C11D *7/50*
U.S. Cl. 252—162 15 Claims

1. The azeotrope comprising about 85-88 weight percent 1,1-difluoro-1,2,2-trichloroethane and about 15-12 weight percent methanol.

4,812,257

PROCESS FOR DRY CATIONIZATION OF STARCH

Reinhard Stober, Hasselroth; Wolfgang Fischer, Hanauer; Michael Huss, Eachborn, and Klaus Udluft, Mainz, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 947,458, Dec. 29, 1986, Pat. No. 4,785,087. This application Oct. 29, 1987, Ser. No. 113,970
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1986, 3604796
Int. Cl.[4] H01M *4/88*
U.S. Cl. 252—182.32 4 Claims

1. A pulverulent mixture consisting of 10 to 50 weight percent of a hydrophilic silica and 50 to 90 weight percent of calcium hydroxide or oxide.

4,812,258

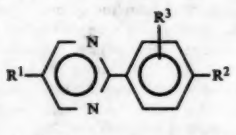
FLUORINE-CONTAINING PYRIMIDINE DERIVATIVES

Joachim Krause, Dieburg; Michael Römer, Rodgau; Ludwig Pohl, Darmstadt, all of Fed. Rep. of Germany; Bernhard Scheuble, Yokohama, Japan, and Georg Weber, Erzhausen, Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 604,679, Apr. 27, 1984, abandoned. This application Apr. 8, 1987, Ser. No. 35,820
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1983, 3315295
Int. Cl.[4] G02F *1/13;* C07D *239/26;* C09K *19/34*
U.S. Cl. 252—299.61 14 Claims

1. In a liquid crystal dielectric useful for electrooptical display elements and comprising at least two liquid crystal components, the improvement wherein at least one component is a fluorine-containing pyrimidine compound of the formula R^1—PhF—R^2 wherein PhF is 2- or 3-fluoro-1,4-phenylene, one of the radicals R^1 and R^2 is alkyl of 1 to 12 C atoms and the other is CN and Z is 1,3-pyrimidine-2,5-diyl.

6. A fluorine-containing pyrimidine compound of the formula



wherein R^1 is alkyl of 4 to 12 C atoms, R^2 is alkyl or alkoxy of 8 to 12 C atoms, and R^3 is fluorine.

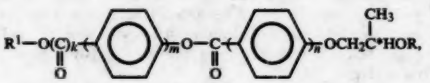
4,812,259

LACTIC ACID DERIVATIVE, LIQUID CRYSTAL COMPOSITION CONTAINING SAME AND LIQUID CRYSTAL DEVICE

Kazuo Yoshinaga, Machida; Kazuharu Katagiri, Tama, and Kenji Shinjo, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 23, 1986, Ser. No. 922,308
Claims priority, application Japan, Nov. 1, 1985, 60-245709; Dec. 13, 1985, 60-280403
Int. Cl.[4] C09K *19/52, 19/12, 19/20;* G02F *1/13*
U.S. Cl. 252—299.65 31 Claims

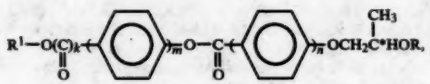
1. An optically active lactic acid derivative represented by the formula (Ib):



(Ib)

wherein R^1 is an alkyl group having 4–16 carbon atoms, R is a linear alkyl group having 1–16 carbon atoms, m and n are 1 or 2 such that m+n=2 or 3, k is 0 or 1, and C* is an asymmetric carbon atom.

13. A liquid crystal composition comprising a mixture of a liquid crystal and at least one species of optically active lactic acid derivative represented by the formula (Ib):



(Ib)

wherein R^1 is an alkyl group having 4–16 carbon atoms, R is a linear alkyl group having 1–16 carbon atoms, m and n are 1 or 2 such that m+n=2 or 3, k is 0 or 1, and C* is an asymmetric carbon atom.

4,812,260
PROCESS FOR PRODUCTION OF MINERAL DISPERSIONS

Lawrence L. Nelson, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 19, 1987, Ser. No. 27,571
Int. Cl.[4] C04B *20/06, 31/22, 31/26;* C01B *33/24*
U.S. Cl. 252—378 R **14 Claims**

1. A process for the production of an aqueous dispersion of vermiculite ore particles comprising the steps of:

(a) contacting vermiculite ore with an aqueous sodium salt solution followed by an aqueous washing therein producing an aqueous suspension of vermiculite ore particles, and then

(b) swelling and delaminating the vermiculite ore particles in one step by contacting the particles in aqueous suspension from step (a) with an aqueous organo substituted ammonium-cation solution wherein the ratio of organo substituted ammonium-cations to exchangeable sodium ions in the aqueous suspension of ore particles from step (a) is less than about 3.5:1 and greater than about 0.1:1, while simultaneously subjecting the suspension to a shearing action.

4,812,261
LUBRICATING OIL CONTAINING VISCOSITY INDEX IMPROVER

Christopher S. Liu, Poughkeepsie; Nicholas Benfaremo, Wappingers Falls; Maria M. Kapuscinski, Carmel, and Larry D. Grina, Wappinger Falls, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 12, 1987, Ser. No. 84,355
Int. Cl.[4] C10M *149/06*
U.S. Cl. 252—51.5 A **40 Claims**

1. A composition comprising a carbon-carbon backbone polymer containing residual unsaturation, and bearing graft moieties derived from a graft monomer containing ethylenic unsaturation and an epoxide moiety which graft polymer has been functionalized with a Mannich base formed by the reaction of (i) an aldehyde, (ii) a polyamine containing at least one primary or secondary amine group and (iii) a non-hindered alkyl phenol.

4,812,262
FIRE-RETARDANT ELECTRIC DEVICE

Akira Shinzawa, and Yoshiki Kohno, both of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Jan. 22, 1988, Ser. No. 147,247
Claims priority, application Japan, Jan. 30, 1987, 62-18628
Int. Cl.[4] H01B *3/20*
U.S. Cl. 252—567 **5 Claims**

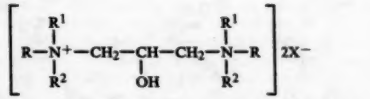
1. An electric device comprising a cellulose-based insulating oil composed of 100 parts by weight of a fatty acid polyol ester having a fire point of at least 300° C., 0.005 to 1.0 part by weight of a phenolic compound having no alkyl substituents at the ortho positions, wherein said phenolic compound is 4 tert.-butylcatechol, 4-tert.-octylphenyl salicylate, 1,1'-bis(4-hydroxyphenyl)cyclohexane, β-naphthol or 4,4'-isopropylidenebisphenol, and 0.01 to 2.0 parts by weight of an epoxy compound.

4,812,263
BIS-QUATERNARY AMMONIUM COMPOUNDS

Robert B. Login, Oakland, N.J., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 909,430, Aug. 22, 1986, Pat. No. 4,734,277, which is a continuation-in-part of Ser. No. 677,738, Dec. 3, 1984, abandoned, which is a continuation-in-part of Ser. No. 519,129, Aug. 1, 1983, abandoned. This application Mar. 28, 1988, Ser. No. 173,834
Int. Cl.[4] C07C *85/00, 103/34, 187/30;* C09F *5/00*
U.S. Cl. 260—404.5 Q **7 Claims**

1. A bis-quaternary ammonium compound represented by the following graphic formula:



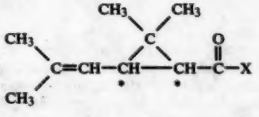
wherein R is a C_{12}–C_{26} alkyl, R^1 and R^2 are the same and are a C_1–C_4 alkyl, and X is a negative radical selected from the group consisting of Cl, F, Br, NO_3, CH_3SO_3 and $CH_3C_6H_4SO_3$.

4,812,264
METHOD FOR RACEMIZATION OF OPTICALLY ACTIVE CHRYSANTHEMIC ACID DERIVATIVES

Gohfu Suzukamo, Osaka; Masami Fukao, Shiga, and Yoji Sakito, Hyogo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 28, 1988, Ser. No. 187,249
Claims priority, application Japan, Apr. 28, 1987, 62-105752; Apr. 28, 1987, 62-105753; Apr. 30, 1987, 62-109515; Apr. 30, 1987, 62-109516; Jun. 10, 1987, 62-145467
Int. Cl.[4] C07C *5/00*
U.S. Cl. 260—544 L **24 Claims**

1. A method for preparing racemized chrysanthemic acid derivatives by treating an optically active chrysanthemic acid derivatives having the formula:



wherein X represents a chlorine atom, a bromine atom or 2,2-dimethyl-3-isobutenyl-cyclopropane carboxyl group and * mark represents asymmetric carbon atom, which comprises contacting with at least one compound selected from the group consisting of hydrogen bromide, a carboxylic acid bromide, an

N-bromine compound, an S-bromine compound, a halo-bromine compound, a silicon-bromide compound, a phosphorus-bromide compound and an SH compound in the presence of a peroxide or an azo compound.

4,812,265

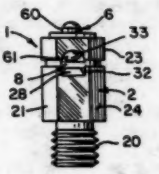
CARBURETOR FUEL INLET VALVE

Michael J. Wolfe, Franklin County, Mo., assignor to Tomco, Inc., St. Louis, Mo.

Filed Dec. 10, 1987, Ser. No. 130,986

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—70 **4 Claims**



1. In a carburetor fuel inlet valve having an elongated, two ended hollow valve body with an upper end and a lower end, a closure defining a top of a cylindrical chamber at said upper end, said closure being circular in plan and having a central aperture, a longitudinal passage in said valve body extending between the lower end of said body, oppposite said closure, and said chamber, a valve seat around an inner end of said passage protruding into said chamber between said passage end and said closure, and a valve actuator with a stem projecting through the aperture in said closure, the improvement comprising said housing chamber having a side wall with two, diametrically opposed cathedral windows through it spaced axially from said upper and lower ends, each with a rectangular lower part adjacent said lower end and an arched upper part adjacent said upper end.

4,812,266

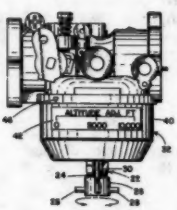
CARBURETOR ALTITUDE COMPENSATOR APPARATUS

John C. Fanner, Coon Rapids, Minn., assignor to Onan Corporation, Minneapolis, Minn.

Filed Sep. 30, 1987, Ser. No. 103,106

Int. Cl.[4] F02M *7/18*

U.S. Cl. 261—71 **7 Claims**



5. A carburetor altitude compensator apparatus used with a carburetor of an internal combustion engine, comprising:

(a) a hand adjustable fuel/air mixture adjustment screw;

(b) an end cap secured to the adjustable screw and rotatable therewith, rotational motion being transmittable from the end cap to the adjustment screw, the end cap including a tracking member rotatable therewith and extending radially of and axially along the adjustment screw, a terminal end portion of the tracking member cooperating with limiting means of the carburetor for limiting adjustment of the fuel/air mixture adjustment screw to a range of fuel-/air mixtures which assures operation of the engine over a predetermined range of altitudes whereby within the predetermined range of altitudes, the engine will not stall regardless of the positioning of the fuel/air mixture adjustment screw;

(c) altitude indicia scale means disposed on the carburetor for indicating in cooperation with the tracking member the altitude to which the fuel/air mixture adjustment screw is set for optimum engine performance; and

(d) a fuel bowl including an indentation wherein the racking member projects into the indentation, movement of the racking member being limited by walls of the indentation.

4,812,267

PROCESS FOR EXTRUDING A THERMOPLASTIC MELT

Karl-Ludwig Hoffmann; Gunter Eiden, both of Frankfurt am Main, and Eugen Morach, Liederbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 2, 1987, Ser. No. 103,887

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1986, 3633966

Int. Cl.[4] B29C *47/12*

U.S. Cl. 264—169 **4 Claims**

1. A process for extruding a thermoplastic melt, in which process a thermoplastic is molten in an extruder at elevated temperature under shear and transported as a homogeneous melt through an extrusion die whose surface coming into contact with the melt is coated, wherein the melt is transported through a die whose surface coming into contact with the melt has been coated by means of a thermal spray process with a powder, having a grain size of 1 to 250 μm, of a metal, a metal alloy, a metal carbide, a metal oxide or a cermet to provide a spray coating roughness of up to about 70 μm.

3. An extrusion forming metal die, wherein a surface coming into contact with the thermoplastic melt has been provided with a coating having a roughness up to about 70 μm by means of a thermal spray process with a powder, having a grain size of 1 to 250 μm, of a metal, a metal alloy, a metal carbide, a metal oxide or a cermet.

4,812,268

SUCKBACK METHOD AND APPARATUS IN AN INJECTION MOLDING MACHINE

Masao Kamiguchi, Houya, and Hiroshi Umemoto, Hino, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

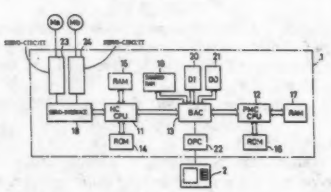
PCT No. PCT/JP87/00542, § 371 Date Mar. 22, 1988, § 102(e) Date Mar. 22, 1988, PCT Pub. No. WO88/00519, PCT Pub. Date Jan. 28, 1988

PCT Filed Jul. 24, 1987, Ser. No. 196,080

Claims priority, application Japan, Jul. 24, 1986, 61-172824

Int. Cl.[4] B29C *45/77*

U.S. Cl. 264—40.1 **7 Claims**



1. In an injection molding machine having a servomotor as an injection axis drive source for axially driving a screw and a servo circuit adapted to drive the servomotor and including an error register for storing therein an error amount indicative of

the difference between a commanded screw position and an actual screw position, and where a torque limit for the servomotor is effected to apply a preset back pressure to a resin in said injection molding machine, a suckback method in said injection molding machine comprises the steps of:

(a) stopping screw rotation when the screw reaches a metering completion position;

(b) reducing the error amount, accumulated in the error register at the time the screw rotation is stopped, to a value less than a predetermined value by performing a pulse distribution during a follow-up operation,

(c) releasing the torque limit for the servomotor; and then

(d) driving the screw backwardly by means of the servomotor by a predetermined suckback amount.

4,812,269

PROCESS FOR PRODUCING HOLLOW FIBER SEMI-PERMEABLE MEMBRANES

Erich H. Harttig, Hechingen; Reinhold J. Buck, Alleshausen, and Hermann J. Gohl, Bisingen-Zimmern, all of Fed. Rep. of Germany, assignors to Gambro Dialysatoren KG, Sweden

Continuation of Ser. No. 826,561, Feb. 6, 1986, abandoned. This application Aug. 6, 1987, Ser. No. 83,900

Claims priority, application Sweden, Mar. 7, 1985, 8501111

Int. Cl.[4] D01D *5/24*; D01F *6/28*

U.S. Cl. 264—41 **6 Claims**

1. A process for producing a homogeneous semipermeable hollow fiber membrane with an inner fiber surface having improved wettability characteristics comprising extruding a solution of a block copolymer including at least one hydrophilic polymer and at least one hydrophobic polymer so as to produce an extrudate of said block copolymer in the form of a hollow fiber having an inner surface, simultaneously injecting a center medium into the center bore of said hollow fiber extrudate, said center medium comprising a non-polar center medium selected from the group consisting of gases, vapors and mixtures thereof, whereby said center medium causes an increase in the wettability of said inner surface of said hollow fiber, and coagulating said hollow fiber extrudate of said block copolymer, so as to form a solidified homogeneous membrane of said block copolymer by extruding said hollow fiber extrudate directly into a fluid capable of causing the coagulation of said hollow fiber extrudate.

4,812,270

NOVEL WATER SOFTENING MEMBRANES

John E. Cadotte, Minnetonka, Minn., and David R. Walker, Kilmarnock, Scotland, assignors to Filmtec Corporation, Minneapolis, Minn.

Division of Ser. No. 856,519, Apr. 28, 1986, Pat. No. 4,765,897. This application Jun. 13, 1988, Ser. No. 206,142

Int. Cl.[4] B01D *13/00*

U.S. Cl. 264—48 **10 Claims**

1. A process comprising making a membrane having properties for enabling water softening, by,

(a) contacting a crosslinked polyamide discriminating layer of a reverse osmosis membrane with an aqueous solution of a compatible strong mineral acid;

(b) maintaining the membrane in contact with the acid at an elevated temperature for a period sufficient to produce a membrane having a flux of at least about 8 gfd and a $MgSO_4$ rejection of at least about 65 percent when tested under reverse osmosis conditions at 50 psi and 25° C. using an aqueous solution of 0.2 weight percent $MgSO_4$; and

(c) contacting the membrane from step (b) with a rejection enhancing agent so as to produce a membrane having a $MgSO_4$ rejection of at least about 85 percent.

4,812,271

CONTINUOUS PROCESS FOR PRODUCING LONG α-ALUMINA FIBERS

Keiichiro Koba; Taizo Utsunomiya; Yoshiaki Saitow; Katsusuke Iwanaga; Michihiko Matsue, and Noriaki Nishitani, all of Tochigi, Japan, assignors to Mitsui Mining Company, Limited, Tokyo, Japan

Filed Sep. 4, 1987, Ser. No. 93,996

Claims priority, application Japan, Sep. 17, 1986, 61-217182

Int. Cl.[4] C04B *33/32*

U.S. Cl. 264—63 **9 Claims**

1. A continuous process for producing long α-alumina fibers which uses, as the starting materia), a slurry composed chiefly of an aqueous solution of a basic aluminum salt and an alumina powder, and, which comprises the steps of preparing a spinnable mixture, spinning the spinnable mixture, and prefiring and firing the spun fiber, said process being characterized in that

(a) said spinnable mixture preparation step comprises preparing a slurry by dispersing, in an aqueous solution of a basic aluminum salt, (i) an alumina powder having an average particle diameter of 0.1 μm or less and used in an amount of 10 to 40% by weight based on the total amount of oxides present in the finally obtained α-alumina fiber, (ii) a spinning aid used in an amount of 4 to 15% by weight based on said total amount of oxides, and optionally (iii) a sintering aid used in an amount, on an oxide basis, of not greater than 3% based on said total amount of oxides, and diluting with water or concentrating the resulting dispersion so as to impart thereto a viscosity of 1,000 to 10,000 poises at 25° C.;

(b) said spinning step comprises dry-spinning said slurry through a spinneret having a plurality of orifices at a spinning rate of 5 to 50 meters per minute, and passing the spun filaments through a drying zone located in proximity to said spinneret, whereupon said filaments are heated to a maximum temperature of 150° C. at a temperature elevating rate of not greater than 1,500° C. per minute and united to form a multifilament yarn composed of precursor materials having free water not more than one-fifth of its original value;

(c) said prefiring step comprises prefiring said multifilament yarn by passing it, without being wound on a bobbin, through a prefiring furnace including a first heating zone having a maximum temperature of 250° to 500° C. and a second heating zone kept at a temperature of 700° to 900° C., the ratio between the residence times of said multifilament yarn in said first and second heàting zones ranging from 2:1 to 4:1, whereby the multifilament yarn having left said second heating zone gives a prefired fiber containing volatile components in an amount of 15 to 25% by weight based on the total weight of said prefired fiber;

(d) said firing step comprises heating said prefired fiber at a temperature of 1,400° to 1,600° C. to evaporate the residual volatile components present therein rapidly;

(e) said steps (b) to (d) are carried out continuously; and

(f) the finally obtained product has an alumina content of not less than 95% by weight.

4,812,272

PROCESS BY COMPACTING A POROUS STRUCTURAL MEMBER FOR HOT ISOSTATIC PRESSING

Jurgen Heinrich, Bonn, and Manfred Bohmer, Lohmar, both of Fed. Rep. of Germany, assignors to Duetsche Forchungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 696,916, Jan. 31, 1985, abandoned. This application Feb. 5, 1987, Ser. No. 11,446

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1984, 3403917

Int. Cl.[4] C04B *35/64*

U.S. Cl. 264—65 **25 Claims**

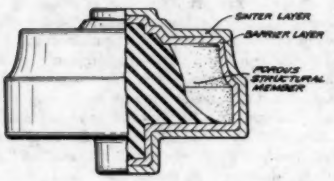
1. A process for compacting a structural member having a complicated shape and an optional size and which is made of

porous ceramic material by encapsulation of said member with porous ceramic material of the same type and which is capable of being sintered and subsequently subjected to hot-isostatic pressing, comprising the steps of:

(a) immersing a preformed porous ceramic body in a suspension of a porous ceramic material of the same type and which has substantially the same coefficient of thermal expansion as said preformed porous ceramic body in a solvent and which contains no sintering aid, and forming a first encapsulating layer on said body;

(b) evaporating the solvent;

(c) immersing the thus obtained body in a second suspension of a porous ceramic material of the same type and which



has substantially the same coefficient of thermal expansion as said preformed porous ceramic body in a solvent and which is capable of being sintered and which contains at least one sintering aid, and forming a second encapsulating layer on said body;

(d) evaporating the solvent;

(e) subjecting the thus obtained body to an elevated temperature in an atmosphere of a protective gas for a sufficient period of time to sinter said body substantially completely;

(f) isostatically compacting said body provided with a tight-sintered surface at pressures in a range of from about 10 MPa to about 300 MPa and temperatures in a range of from about 1600° C. to about 2300° C.;

(g) mechanically removing the two encapsulating layers.

4,812,273

MOULDING OF CONSTRUCTION PRODUCTS BY VIBRATION AND PRESSURE APPLICATIONS AT RELATIVELY SMALL INTENSITIES

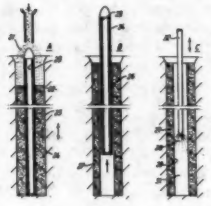
Christopher G. Bevan, Corby, United Kingdom, assignor to C. G. Bevan Associates Limited, Northhamptonshire, England

Filed Nov. 7, 1986, Ser. No. 928,060

Claims priority, application United Kingdom, Nov. 7, 1985, 8527491

Int. Cl.[4] B28B *1/08, 1/10, 7/32*

U.S. Cl. 264—71 **11 Claims**



1. A method for the manufacture of cored construction products comprising dry particulate materials, comprising the steps of providing a mould having at least one core former therein, vibrating the mould, with means operating substantially in the axial direction of the at least one core former, whilst progressively filling the mould with an appropriate mix of the materials, applying pressure to the materials in the mould in a direction transversely of the at least one core former, thereafter withdrawing the at least one core former to leave a corresponding core void, and then applying a sufficient quantity of setting liquid to a free surface of the materials to give full impregnation thereof by capillary action, wherein the vibration of the mould is at relatively small intensities to effect pre-compaction of the materials whereby individual particles of the materials are rearranged into substantially uniform, more closely spaced disposition sufficient that upon the subsequent application of said pressure the materials are brought into a final compacted state without substantial redistribution or local crushing of the particles.

4,812,274

METHOD OF MAKING EXTRUDED CONDUITS

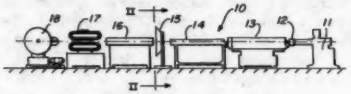
Jean-Jacques Labaig; Michel Fenie, both of Bernay, and Michel Glotin, Serquigny, all of France, assignors to Atochem, France

Filed Apr. 3, 1987, Ser. No. 34,343

Claims priority, application France, Apr. 4, 1986, 86 04880

Int. Cl.[4] B29C *47/90*

U.S. Cl. 264—80 **6 Claims**



1. The process of making a thermoplastic polymer conduit having a conduit wall of substantially uniform crystalline morphology throughout the entire thickness thereof free of any oriented surface zone, comprising extruding and shaping a semi-crystalline thermoplastic polymer into the form of a conduit with an exterior oriented surface zone extending into only a portion of the outer wall thereof, control heating said exterior conduit wall for a time and at a temperature sufficient to melt said oriented surface zone while retaining the remainder of the wall in an unmelted condition, and cooling said conduit wall to recrystallize said oriented surface zone to substantially the same crystalline morphology as the remainder of said conduit wall.

4,812,275

PROCESS FOR THE PRODUCTION OF MOLDED ARTICLES HAVING PARTIAL METAL PLATING

Tetsuo Yumoto, Tokorozawa, Japan, assignor to Sankyo Kasei Kabushiki Kaisha, Tokyo, Japan

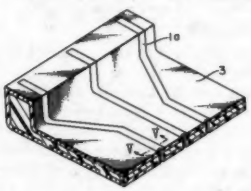
Filed Oct. 15, 1987, Ser. No. 109,353

Claims priority, application Japan, Nov. 18, 1986, 61-273035

The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.

Int. Cl.[4] B29C *59/00*

U.S. Cl. 264—129 **20 Claims**



1. A process for producing a partially-plated molded article comprising the steps of molding within a first mold without a catalyst a primary article having a surface with protrusions, chemically roughening said surface and said protrusions of said primary molded article, treating said chemically-roughened

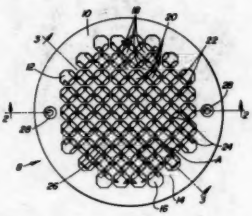
surface and said chemically-roughened protrusions of said primary article with a catalyst, disposing said primary article with said chemically-roughened and catalytically-treated surfaces and protrusions within a second mold, molding within said second mold a secondary molded article about said first primary molded article such that at least some outer surface sections of said protrusions are exposed, and plating said exposed outer surface sections with metal.

4,812,276

STEPWISE FORMATION OF CHANNEL WALLS IN HONEYCOMB STRUCTURES

Tai-Hsiang Chao, Mt. Prospect, Ill., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Apr. 29, 1988, Ser. No. 188,783
Int. Cl.[4] B29C *47/12*
U.S. Cl. 264—177.11 **19 Claims**



1. A method of forming a honeycomb structure having a plurality of channels with intersecting channel walls from an extrudable material, said method comprising:

(a) pressing said material in substantially axial flow through a first partitioning zone and subdividing the material into a first series of parallel and distinct flow segments and forming at least a first portion of said channel walls on the surface of said flow segments;

(b) passing said extrudable material in substantially axial flow out of said first partitioning zone and maintaining the form of at least part of said first portion of channel walls in said extrudable material;

(c) pressing said extrudable material in substantially axial flow through at least a second partitioning zone, subdividing the feed material into a second series of parallel and distinct flow segments, displacing a portion of the extrudable material from the axial flow path of said first segments to form a second portion of said channel walls on the surface of said segments in said second series, and maintaining at least in part the form of said first portion of channel walls;

(d) passing said material through a discharge zone wherein said extrudable material flows laterally and axially to complete the formation of said channel walls; and

(e) discharging an extruded honeycomb structure having a plurality of intersecting channel walls.

4,812,277

PROCESS FOR THE PREPARATION OF POLYVINYL ALCOHOL ARTICLES OF HIGH STRENGTH AND MODULUS

Floribertus C. H. Mokveld, Roermond, and Ronald M. A. M. Schellekens, Maastricht, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Continuation of Ser. No. 898,403, Aug. 20, 1986, abandoned. This application Oct. 13, 1987, Ser. No. 106,592
Claims priority, application Netherlands, Aug. 23, 1985, 8502315
Int. Cl.[4] D01F *6/14*
U.S. Cl. 264—185 **13 Claims**

1. Process for the preparation of an article having a high tensile strength and modulus from polyvinyl alcohol, comprising the steps of:

(a) forming a solution of a polyvinyl alcohol in a suitable solvent or mixture of solvents and converting said solution into a shaped, solvent-containing article at a temperature above the dissolution temperature of polyvinyl alcohol in said solvent or solvent mixture;

(b) converting said shaped article into a gel article having a homogeneous gel structure by rapid cooling thereof to below the gelation temperature;

(c) substantially removing the solvent present in said gel article by extraction with a mixture of water and a lower aliphatic alcohol or ketone having a water content of 20–95 vol. %;

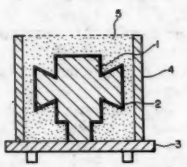
(d) stretching the gel article, during or after solvent removal, at a temperature above the glass transition temperature but below the decomposition temperature of polyvinyl alcohol employing a stretch ratio of at least 10.

4,812,278

PROCESS FOR PREPARING MOLD

Tatsuo Natori; Susumu Hioki, both of Kashiwa; Takashi Shimaguchi, Ibaraki; Toshihiro Yamada, Ibaraki; Akihide Watanabe, Ibaraki, and Kensuke Kanekatsu, Yono, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 771,813, Sep. 3, 1985, abandoned. This application Feb. 25, 1987, Ser. No. 19,135
Claims priority, application Japan, Aug. 31, 1984, 59-180513; Oct. 24, 1984, 59-222026
Int. Cl.[4] B29C *33/38*
U.S. Cl. 264—221 **41 Claims**



1. A process for preparing a mold for casting which comprises;

making a pattern from an organic material soluble in a solvent;

forming a coating film on the surface of said pattern from a material insoluble in said solvent to prepare a mold pattern;

filling an area around said mold pattern with a molding material for forming a mold;

dissolving said pattern with said solvent to form dissolved pattern residue of reduced volume while said molding material is in a non-hardened state;

hardening said mold by heating; and

removing the dissolved pattern residue with said coating film from said mold to create a casting cavity in the mold into which a fluid material can be poured.

4,812,279

PROCESS FOR PREPARATION OF CELLULOSE ESTER FILMS

Hiroaki Nakagawa; Masahiro Kondo, and Noriake Ohishi, all of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jun. 12, 1987, Ser. No. 60,799
Claims priority, application Japan, Jun. 12, 1986, 61-137212
Int. Cl.[4] B29C *41/04*
U.S. Cl. 264—311 **12 Claims**

1. A process for the preparation of cellulose ester films, which comprises dissolving a cellulose ester in an organic

solvent, coating the solution on a substrate under rotation and peeling the film formed on the substrate from the substrate, wherein a second organic solvent having a compatibility with the organic solvent and being a poor solvent to the cellulose ester is added to the organic solvent solution of the cellulose

ester to precipitate a cellulose ester having a high molecular weight in the cellulose ester, the cellulose ester having a high molecular weight is separated from the solution, and the remaining cellulose ester solution is formed into a cellulose ester film by the rotational film-forming method.

4,812,280

PROCESS FOR FABRICATION OF LARGE TITANIUM DIBORIDE CERAMIC BODIES

Arthur J. Moorhead; E. S. Bomar, and Paul F. Becher, all of Knoxville, Tenn., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Apr. 17, 1986, Ser. No. 853,118
Int. Cl.[4] C04B *35/58*
U.S. Cl. 264—332 **4 Claims**

1. A process for forming TiB_2 ceramic bodies having a flexural strength greater than 400 MPa and a density greater than 99% of theoretical density comprising:

forming a mixture comprising TiB_2 powder and a sintering aid selected from the group nickel, nickel aluminide and mixtures thereof;

lining a die with a no dense nonreactive material capable of absorbing said sintering aid and of protecting said die from interacting with said TiB_2 powder;

in a nonoxidizing atmosphere placing said mixture in said die;

in a nonoxidizing atmosphere applying pressure of about 5 percent of final pressure and raising temperature to a level sufficiently low to avoid grain growth an said TiB_2 but sufficiently high to liquify said sintering aid under final pressing pressure said temperature being about 1550 C.;

increasing pressure at a sufficiently slow and steady rate so that sintering aid liquefaction, material transfer, temperature dispersing and compaction occur at a suitable rate to maximize strength, toughness and density of a resulting TiB_2 ceramic and to cause said sintering aid to migrate to the surface of said ceramic body said rate being from 5 percent of final pressure pressure over about 30 minutes, the final pressure being from 12 to 24 MPa;

in a nonoxidizing atmosphere, holding said final temperature and said final pressure stable for not less than two hours;

releasing said pressure and lowering said temperature to ambient conditions.

4,812,281

PRESSURIZATION OF TIRE MOLD VENTS

Richard C. Beard, Massillon, and Carl W. Crispin, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

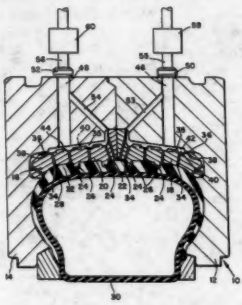
Filed Dec. 14, 1987, Ser. No. 132,038
Int. Cl.[4] B29C *35/02*; B28B *7/12, 17/00*
U.S. Cl. 264—502 **6 Claims**

1. A method of forming a substantially trimless tire by molding and vulcanizing a reinforced rubber tire casing in a heated tire mold having a mold body and a tread ring with a sealed cavity between said mold body and said tread ring in communication with a plurality of vent holes at spaced-apart positions in a molding surface of said tread ring wherein a source of fluid pressure is in communication with said sealed cavity comprising:

(a) opening said mold;

(b) placing an unvulcanized tire casing having a tread portion in said mold;

(c) closing said mold and expanding said tire casing against said tread ring to form a tread pattern in said tread portion



and fill out of said mold while permitting air and other gases trapped between an outer surface of said tread portion and said tread ring to escape through said vent holes;

(d) vulcanizing the expanded tire casing and applying fluid pressure to said sealed cavity sufficient to pressurize said vent holes to limit entrance of rubber into said vent holes during said vulcanizing of said tire casing;

(e) then applying fluid pressure to said sealed cavity sufficient to pressurize said vent holes for separating said tire casing from said molding surface;

(f) opening said mold; and,

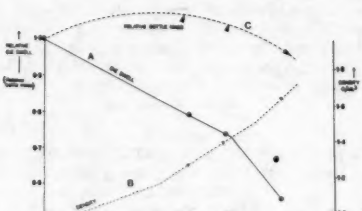
(g) unloading said substantially trimless tire from said mold.

4,812,282

PROCESS FOR FORMING POLYMER CONTAINER HAVING INORGANIC FILLER AND COUPLING AGENT

Edward T. Hill, Johannesburg, South Africa, assignor to Standplastics (Proprietary) Limited, Johannesburg, South Africa

Filed Sep. 29, 1987, Ser. No. 102,326
Int. Cl.[4] B29C *49/04*
U.S. Cl. 264—540 **20 Claims**



1. A method of producing a container, comprising the steps of:

(a) providing a polymer composition comprising a polymer selected from the group consisting of olefin polymers,

olefin co-polymers and vinylchloride polymers, and 20 to 55% by mass of the composition of an inorganic filler having a density in the range of 2 to 3 g/cc and an average particle size of less than 50 microns and a coupling agent having a group capable of bonding to the surface of the filler and an organophilic segment compatible with said polymer;

(b) extruding the composition through a die to form a discrete hollow extrudate;

(c) inflating the extrudate against a mould surface to form the container; and

(d) removing the container from the mould surface, and wherein said container is formed having a mass within 10% of a container if formed using the claimed process and composed of 100% of said polymer, and wherein said container is formed having impact resistance and content diffusion properties adequate to replace the container formed of 100% of said polymer.

4,812,283

METHOD OF MANUFACTURE OF FORMED ARTICLE

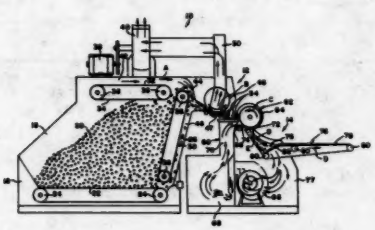
Radcliffe W. Farley, Worcester, Pa.; Edward A. Vaughn, Clemson, S.C.; Clarke A. Rodman, East Providence, R.I., and Edward C. Homonoff, Brooklyn, Conn., assignors to Allied-Signal Inc., Morristown, N.J.

Filed May 2, 1986, Ser. No. 858,785

The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.

Int. Cl.[4] B29C *43/02*; D04H *1/54*

U.S. Cl. 264—518 **8 Claims**



1. Method of manufacturing molded articles comprising the steps of forming a nonwoven, air laid batt from structural fibers by pneumatically conveying the fibers in an air stream randomly depositing said fibers on a condenser to form a nonwoven gas permeable, compressible batt having a substantial portion of its fibers interlocking randomly in each of the three spatial dimensions, adding a thermoplastic binder material to the fibers molding the batt by forcing a gas through the batt to thereby mold the batt without substantial compression of the batt, and heating the batt during molding to a temperature to at least partially melt the binder material to form the batt into a shape-retaining article.

4,812,284

PROCESS FOR HEAT TREATMENT OF NONWOVENS

Gerold Fleissner, Chur, Switzerland, assignor to Fleissner GmbH & Co., Egelsbach, Fed. Rep. of Germany

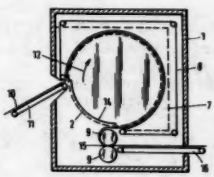
Continuation of Ser. No. 654,178, Sep. 25, 1984, abandoned. This application Nov. 21, 1986, Ser. No. 933,162

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1983, 3334787

Int. Cl.[4] D04H *1/54*

U.S. Cl. 264—555 **4 Claims**

1. A process for the heat treatment of lightweight nonwoven textile materials containing, for bonding purposes, fusible fibers, bi-component fibers or other bondable thermoplastic fibers at high delivery speeds, which comprises feeding a continuous length of the nonwoven textile material to a sieve drum subjected to a suction draft within a housing at a feeding speed of between 100 and 500 m/min. or more; heating the nonwoven textile material up to at least 70–80% of the bonding temperature on the sieve drum, the nonwoven textile material being retained on the sieve drum during the heat treatment and also exposed to a temperature flow of hot treatment gases on said sieve drum; and passing the heated nonwoven textile material immediately thereafter through a pair of heated pressure rolls during which the nonwoven textile material is com-



pressed uniformly at a pressure of 1–20 kg/cm over its operating width and embossed under heating to exhibit a light, bulky handle; said pressure rollers being located within the housing surrounding said sieve drum, the embossed nonwoven textile material being delivered from said housing via an opening in a wall of the housing and a continuous length of nonwoven textile material being introduced into the housing via another opening in a wall of the housing prior to being heated on said sieve drum, the nonwoven textile material fed to the sieve drum having a density of 5–500 g/m^2.

4,812,285

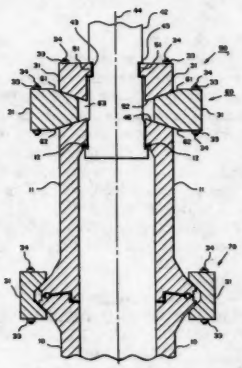
INSTRUMENTATION PORT CLAMPS AND CLAMPING SYSTEMS

Cecil R. Stapleton, Pensacola, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 925,863, Oct. 30, 1986. This application Jun. 5, 1987, Ser. No. 58,952

Int. Cl.[4] G21C *13/00*

U.S. Cl. 376—203 **18 Claims**



1. A system for sealing the interface between the tubular conduit seal and the tubular male flange of an instrument port of a nuclear reactor head comprising:

(a) the male flange having a clamp receiving end portion comprising a frusto-conically shaped surface;

(b) the tubular conduit seal having an annular groove on the exterior thereof;

(c) a ring-shape positioner having an inwardly extending annular flange at least partially contained within said

annular groove, and further having a clamp receiving portion comprising frusto-conically shaped surface; and

(d) a generally ring-shape articulated clamp in engagement with said clamp receiving portions, said clamp including an inwardly extending wedge-shape portion which engages said clamp receiving portions such that adjustment of the internal radius of said clamp causes an adjustment of the axial pressure on said instrument port column.

4,812,286

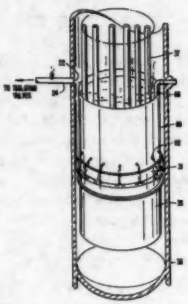
SHROUD TANK AND FILL PIPE FOR A BOILING WATER NUCLEAR REACTOR

Douglas M. Gluntz, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Feb. 8, 1988, Ser. No. 153,163

Int. Cl.[4] G21C *9/00, 15/00*

U.S. Cl. 376—282 **20 Claims**



13. In a boiling water nuclear reactor of the type having a reactor vessel containing saturated water coolant, a reactor core contained in said reactor vessel for heating water to create a two-phase steam/water mixture, a steam separator for classifying said steam from said water in said two-phase mixture and returning separated water to said core, and standpipes for conveying said two-phase mixture from said core to said separator, a method for cooling said reactor core comprising the steps of:

providing a shroud tank;

disposing a shroud tank inside said reactor vessel overlying said reactor core and circumscribing said standpipes, said shroud tank having an open top, and a closed bottom;

providing coolant inlet means communicated from the exterior of said reactor to the inside of said shroud tank;

providing a source of cold coolant;

communicating said cold coolant to said coolant inlet means;

filling said shroud tank with cold coolant during normal operation of said reactor; and

communicating said coolant from said shroud tank into said reactor vessel to cool said reactor core during a LOCA.

4,812,287

NICKEL-CHROMIUM STAINLESS STEEL HAVING IMPROVED CORROSION RESISTANCES AND MACHINABILITY

Yoshinori Nakayama, Kumagaya, and Kikuo Takizawa, Kazo, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

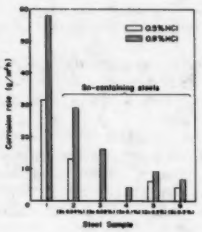
Filed Feb. 18, 1988, Ser. No. 157,265

Claims priority, application Japan, Apr. 30, 1987, 62-107362; Apr. 30, 1987, 62-107363

Int. Cl.[4] C22C *38/40*

U.S. Cl. 420—41 **2 Claims**

1. A nickel-chromium austenitic stainless steel having improved corrosion resistances and machinability, comprising less than 0.08 wt. % of C, less than 1.0 wt. % of Si, less than 0.7 wt. % of Mn, less than 0.04 wt. % of P, less than 0.005 wt. % of S, 8.0 to 12.0 wt. % of Ni, 17.0 to 20.0 wt. % of Cr, 0.40 to



0.80 wt. % of Mo, less than 0.3 wt. % of Cu, 0.03 to 0.5 wt. % of Sn and the balance of Fe.

4,812,288

NON PRECIOUS NICKEL BASED CHROMIUM CONTAINING ALLOY FOR DENTAL PROSTHESES

Alberto Tamba; Silverio Fioravanti, both of Rome, and Antonio Scaccia, Veroli, all of Italy, assignors to Centro Sviluppo Materiali S.p.A., Rome, Italy

Filed Jan. 5, 1988, Ser. No. 141,612

Claims priority, application Italy, Jan. 9, 1987, 47511 A/87

Int. Cl.[4] C22C *19/05*

U.S. Cl. 420—443 **6 Claims**

1. Alloy for dental prostheses consisting essentially of:

Cr	22.0–25.0% weight
Mo	5.5–7.5% weight
Si	2.0–4.5% weight
B	0.25–0.50% weight
Al	≦0.2% weight
Fe	≦0.5% weight
C	≦0.05% weight
Cu	≦0.5% weight
Mn	≦0.5% weight
S	≦0.01% weight
Rare earths	0.005–0.2% weight

remainder Ni and impurities.

4,812,289

OXIDE DISPERSION HARDENED ALUMINUM COMPOSITION

Guy B. Alexander, Salt Lake City, Utah, assignor to Technical Research Assoc., Inc., Salt Lake City, Utah

Division of Ser. No. 902,946, Sep. 2, 1986, Pat. No. 4,731,132, which is a continuation-in-part of Ser. No. 654,476, Sep. 26, 1984, abandoned. This application Dec. 7, 1987, Ser. No. 129,233

Int. Cl.[4] C22C *21/00*; B22F *9/00*

U.S. Cl. 420—528 **21 Claims**

1. A method for producing a metallic product having a matrix consisting essentially of aluminum with discrete particles of strengthening oxide dispersed throughout the matrix, said method comprising the steps of:

providing a volume of said strengthening oxide in the form of discrete particles having a mean particle size no greater than 0.025 microns;

surrounding said discrete particles of strengthening oxide with a sufficient amount of particles of a second oxide, selected from the group consisting of copper oxide and iron oxide, to maintain the particles of strengthening oxide separate and discrete from each other and to form a first dispersion consisting essentially of up to 20 vol. % of said particles of strengthening oxide dispersed in said second oxide;

reacting said second oxide in said first dispersion with hydrogen at an elevated temperature to reduce the second oxide to a metal;

continuing said reacting step until the oxygen content of any unreduced second oxide from the first dispersion is less than 0.1 wt. % of the amount of said metal reduced from the second oxide;

forming, as a result of said reacting step, a second dispersion consisting essentially of said discrete particles of strengthening oxide dispersed in substantially oxygen-free particles of said metal which surround said discrete particles of strengthening oxide;

pressing said second dispersion into a compressed form;

providing a molten bath consisting essentially of aluminum as the predominant component and including a wetting metal for said strengthening oxide;

adding said compressed form, in a substantially oxgen-free condition, to said molten bath, to disperse said discrete particles of strengthening oxide substantially uniformly throughout said molten bath;

slowly dissolving into said molten bath, the metal surrounding said particles of strengthening oxide;

preventing said particles of strengthening oxide from aggregating during the above-recited steps;

and then pouring said molten bath containing said dispersed strengthening oxide into a casting form.

4,812,290

THIRD ELEMENT ADDITIONS TO ALUMINUM-TITANIUM MASTER ALLOYS

Geoffrey K. Sigworth, Reading, Pa., assignor to KB Alloys, Inc., Sinking Spring, Pa.

Filed Sep. 8, 1986, Ser. No. 904,511

Int. Cl.[4] C22C *21/00, 1/02*

U.S. Cl. 420—552 **13 Claims**

1. A method of making an Al-Ti-C master alloy comprising of steps of:

preparing an alloy of Al-Ti-C at a temperature below about 1150° C. consisting essentially of, in weight percent, carbon up to 0.1, titanium 2 to 15, and the balance aluminum plus impurities normally found in master alloys;

superheating the alloy to a temperature above about 1150° C. for a time sufficient to place the carbon into solution in the alloy; and

casting the alloy to produce a master alloy consisting essentially of, in weight percent, carbon up to 0.1, titanium 2 to 15, and the balance aluminum plus impurities normally found in master alloys, wherein the alloy is substantially free of carbides greater than about 5 microns in diameter.

4,812,291

METHOD OF FUMIGATING AGRICULTURAL PRODUCTS USING HYDROGEN PHOSPHIDE

Wolfgang Friemel, Heppenheim; Volker Barth, Ludwigshafen; Martin Münzel, Bensheim, and Reiner Ehret, Weinheim, all of Fed. Rep. of Germany, assignors to Detia Freyberg GmbH, Laudenbach, Fed. Rep. of Germany

Filed Mar. 12, 1987, Ser. No. 25,038

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1986, 3608256

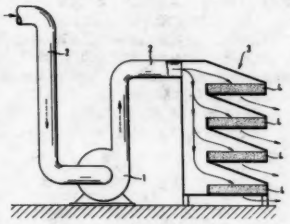
Int. Cl.[4] A23L *3/34*

U.S. Cl. 422—28 **19 Claims**

1. A method for preventing the release into the atmosphere of hydrogen phosphide during or after the fumigation therewith of an agricultural product stored in a bulk storage or transportation facility which is only partially filled therewith and from which hydrogen phosphide can escape during or after the fumigation, which comprises the steps of:

(a) covering the exposed outer surface of the stored product with a flexible sheet material which is at least substantially gas impervious, in a manner which isolates the stored product from the surrounding unfilled storage space in the facility and at least hinders gas exchange between the filled portion of the storage space of the facility beneath the flexible material and the filled space above the flexible material;

(b) introducing a fumigating amount of hydrogen phosphide into the thus-covered stored product;



(c) actively withdrawing and collecting air from the unfilled storage space above the covered product in an amount effective to prevent hydrogen phosphide from escaping into the atmosphere from the facility; and

(d) removing any hydrogen phosphide in the withdrawn air therefrom before discharging that air into the atmosphere.

4,812,292

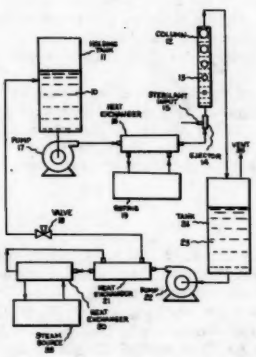
CHEMICAL STERILANT RECOVERY AND CONVERSION

Larry Joslyn, Macedon, N.Y., assignor to Joslyn Valve Corporation, Macedon, N.Y.

Filed Oct. 26, 1987, Ser. No. 112,334

Int. Cl.[4] A61L *9/00*; A01N *63/00*; F28D *7/00*; C07C *27/00*

U.S. Cl. 422—31 **7 Claims**



1. In a process for sterilizing articles by contacting said article with an alkoxide sterilant gas and subsequently recovering said alkoxide gas from the sterilization process, the improvement wherein said recovery step comprises:

(a) cooling an aqueous liquid stream at which the alkoxide sterilant gas is highly soluble in the liquid of the stream;

(b) mixing the liquid stream cooled during said cooling step with a second stream of alkoxide sterilant gas to provide a resulting solution in an aqueous third stream of said gas dissolved in the liquid of said first named aqueous stream;

(c) subjecting the third aqueous stream containing said alkoxide sterilant gas dissolved therein to conditions of temperature and pressure causing hydrolysis of said dissolved sterilant and for a period of time sufficient to hydrolyze

substantially all of the dissolved sterilant and provide an aqueous solution of hydrolysate; and

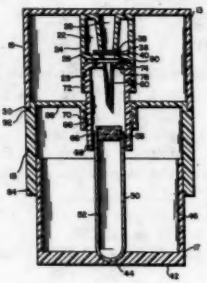
(d) recycling said aqueous solution of hydrolysate as said first named liquid stream to said cooling step.

4,812,293

VACUUM ACTUATED ASSAY DEVICE AND METHOD OF USING SAME

Daniel A. McLaurin, Cary; Beverly M. Fleming, Raleigh, and James P. O'Connell, Chapel Hill, all of N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 880,454, Jun. 30, 1986, abandoned.
This application Feb. 22, 1988, Ser. No. 159,485
Int. Cl.[4] G01N *1/18*; B01L *3/00*
U.S. Cl. 422—69 **27 Claims**



1. An assay device comprising:

(a) a permeable membrane having attached thereto a component of an assay, said membrane having a bubble point of about 1.5 to 5.0 kg/cm^2 which allows passage of liquid therethrough but which precludes passage of gas therethrough when a pressure differential exists across said membrane and said membrane is wet;

(b) liquid holding means having an open end covered by said membrane;

(c) pre-evacuated liquid receiving means; and

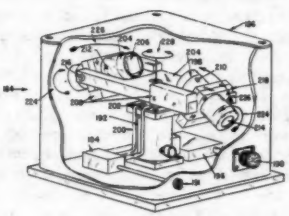
(d) actuating means between said membrane and said receiving means and removably affixed to said holding means to establish said pressure differential whereby fluid communication between said receiving means and said membrane is established.

4,812,294

SPECIMEN PROCESSING SYSTEM

John W. Combs, Baltimore, Md., assignor to Automated Diagnostic Systems, Inc., Arlington, Va.

Continuation of Ser. No. 834,545, Feb. 28, 1986, abandoned.
This application Mar. 2, 1987, Ser. No. 20,530
Int. Cl.[4] G01N *21/00*; B04B *1/00*
U.S. Cl. 422—72 **6 Claims**



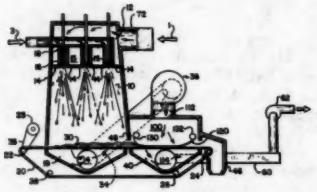
1. A centrifugal processing unit for directing the movement of substances within a specimen preparation unit having a plurality of compartments which comprises: (a) a rotor, (b) means for rotating said rotor to create a centrifugal force, said rotor having handling means for receiving a specimen preparation unit to whose contents the centrifugal force is applied and for rotating a specimen preparation unit about either or both of two axes orthogonal to each other and to the centrifugal force vector, into any selected orientation with respect to the direction of the centrifugal force applied by the rotor; and (c) control means for accelerating and decelerating the rotor and for causing said handling means to rotate a specimen preparation unit about either or both of said orthogonal axes to a plurality of different non-parallel selected orientations with respect to the centrifugal force vector, in a desired sequence.

4,812,295

APPARATUS FOR DRY SCRUBBING A HOT GAS AND START-UP PROCESS

Gerald E. Bresowar, Homewood, Ala., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 1, 1987, Ser. No. 103,336
Int. Cl.[4] C01B *17/56*; B01D *50/00*
U.S. Cl. 422—169 **1 Claim**



1. A spray dryer apparatus for scrubbing acidic gas from a hot gas comprising:

a. a housing enclosing a primary drying chamber and a secondary drying chamber laterally adjacent the primary drying chamber and substantially separated therefrom by a division wall mounted within said housing, said housing having a first gas inlet opening into an upper portion of the primary drying chamber for receiving a flow of hot gas containing an acidic gas to be removed therefrom, a first gas outlet opening from a lower portion of the primary drying chamber, a second gas inlet opening into an upper portion of the secondary drying chamber, and a second gas outlet opening from a lower portion of the secondary chamber;

b. first duct means interconnected between the first gas outlet of the primary drying chamber and the second gas inlet of the secondary drying chamber for providing a gas flow passageway therebetween;

c. draft producing means connected in flow communication with the primary and secondary drying chambers for causing the flow of gas from the first gas inlet through the primary drying chamber, thence through the first gas outlet, thence through the first duct means, thence through the second gas inlet, thence through the secondary drying chamber, and thence out of said housing through the second gas outlet;

d. at least one spray means opening into the primary drying chamber for introducing a spray of a liquid and solid particles of an alkali or alkaline reactant into the primary drying chamber to contact the hot gas passing therethrough to react with the acidic gas in the hot gas;

e. an endless collecting belt supported for horizontal movement sequentially through the primary drying chamber located between the first gas inlet and the first gas outlet thereof and thence through the secondary drying chamber

between the second gas inlet and the second gas outlet thereof;

f. drive means for advancing the endless collecting belt; and

g. supplemental filter means operatively associated with the secondary drying chamber for filtering particulate material from the flue gas passing therethrough, said supplemental filter means comprising gas permeable filter means selectively positionable across a region of the secondary drying chamber between the second gas inlet to the secondary drying chamber and the second gas outlet form the secondary drying chamber and upstream with respect to flue gas flow of said endless collecting belt whereby at least a substantial portion of the flue gas passing through the secondary drying chamber passes through said gas permeable filter means prior to passing through said endless collecting belt; said gas permeable filter means comprising an elongated gas permeable fabric sheet, a first roll, a second roll, drive means for rotating at least one of said first and second rolls in synchronization with collecting belt drive means so as to withdraw the gas permeable fabric sheet from said region of said secondary drying chamber in synchronization with the endless collecting belt passing through the secondary drying chamber, and means for operatively connecting said gas permeable fabric sheet between said first and second rolls whereby upon rotation of said rolls said gas permeable fabric sheet is unwound from one of said rolls and taken-up onto the other of said rolls, said first and second rolls disposed within the secondary drying chamber across the second gas inlet to the secondary drying chamber.

4,812,296

PROCESS UTILIZING CATALYTIC MATERIAL FOR THE REDUCTION OF NITROUS OXIDES

Helmut Schmelz, Prien; Helmut Thomann, Munich; Renate Kuschke, Feldkirchen-Westerham; Eva-Helga Wilbert, Munich; Wolfgang Gajewski, Buckenhof; Josef Sprehe, Fürth-Vach; Norbert Landgraf, Rückersdorf; Hans Ranly, Marloffstein; Lothar Balling, Fürth; Richard Repplsch, Herzogenaurach, and Dietmar Hein, Nuremberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Division of Ser. No. 904,186, Sep. 5, 1986, abandoned. This application Jan. 22, 1988, Ser. No. 147,592

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1985, 3531809

Int. Cl.[4] B01J *8/00*; C01B *21/00*

U.S. Cl. 423—239 **8 Claims**

1. Method for reducing nitrous oxides in flue gases, which comprises contacting a flue gas containing nitrous oxides, in the presence of ammonia, in a temperature range of 150° to 550° C., with a catalytic material, formed by subjecting, titanium oxide milled with vanadium oxide and one or more oxides of the elements selected from the group consisting of tungsten, molybdenum, phosphorus, chromium, copper, iron and uranium to at least one termal treatment, wherein the oxides of the elements tungsten and molybdenum are substituted partially or entirely by phosphorus in the form of its oxides or phosphates, and the sum of the elements used in the form of oxides, tungsten, molybdenum, vanadium, chromium, copper, iron and uranium are present in amounts of less than 1 atom percent referred to titanium and phosphorus used in the form of its oxides or phosphates, is present in amounts of 1 to 30 atom percent, referred to titanium.

4,812,297

PREPARATION OF N-(DICHLOROPHOSPHORYL)TRICHLOROPHOSPHAZENE

Nadine Passimourt, Pau, and Philippe Potin, Billere, both of France, assignors to Atochem, Puteaux, France

Filed Mar. 10, 1988, Ser. No. 166,270

Claims priority, application France, Mar. 10, 1987, 87 03249

Int. Cl.[4] C01B *25/10*

U.S. Cl. 423—300 **6 Claims**

1. A process for the preparation of N-(dichlorophosphoryl)-trichlorophosphazene [P_2NOCl_5], comprising reacting phosphorus pentachloride with ammonium chloride, to obtain a reaction medium containing P_3NCl_{12}, and decomposing the P_3NCl_{12} contained in said reaction medium in the presence of an oxygen donor to produce N-(dichlorophosphoryl) trichlorosphosphazene [P_2NOCl_5], and wherein more than 50% by weight of said ammonium chloride comprises particles of a size less than 0.16 mm.

4,812,298

METHOD FOR PRODUCING SIALON POWDERS

Yasuhiko Kohtoku; Teturo Kunisawa, and Takuji Takahashi, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Sep. 23, 1986, Ser. No. 910,601

Claims priority, application Japan, Sep. 27, 1985, 60-21267

Int. Cl.[4] C01B *33/26*

U.S. Cl. 423—327 **8 Claims**

1. A method for producing a crystalline sialon powder, comprising the steps of:

(a) mixing the following components in a composition for a desired sialon:

(i) an amorphous silicon nitride powder,

(ii) an oxygen-containing compound of silicon and/or aluminum, and

(iii) aluminum metal, aluminum nitride and/or silicon; said components being selected in kind and in amount to produce a sialon of the formula $Si_{6-Z}Al_ZO_ZN_{8-Z}$ where Z is a number greater than 0 and up to 4.2, and then

(b) heating the resultant mixture at a temperature in a range of 1300° C. to 1800° C. in a nitrogen-containing atmosphere to obtain crystallized sialon powder having primary particles in the range of 0.2 to 2 μm.

4,812,299

SYNTHETIC ALKALI METAL ALUMINO-SILICATES, METHODS AND USES, COMPOSITIONS AND THEIR METHODS OF PREPARATION

Satish K. Wason, Macon, Ga., assignor to J. M. Huber Corporation, Rumson, N.J.

Continuation-in-part of Ser. No. 875,120, Jun. 17, 1986, abandoned. This application Nov. 3, 1987, Ser. No. 116,805

Int. Cl.[4] C01B *33/26*; D21H *3/66*

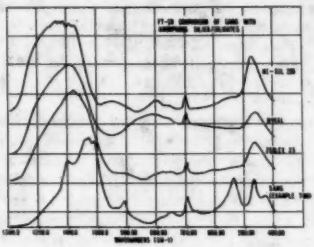
U.S. Cl. 423—328 **22 Claims**

1. An alkali metal alumino-silicate having a composition in terms of mole ratio of oxides as follows:

$$xM_2O:Al_2O_3:ySiO_2:zH_2O$$

wherein x is the number of moles of alkali metal oxide and is an integer of 0.01 to 2.0, M is an alkali metal, y is the number of moles of SiO_2 associated with the compositions and is an integer of 2.0 to 20.0, and z is the number of moles of bound water

and is an integer of 1.0 to 5.0, wherein primary particles of said alkali metal alumino-silicate comprise a core of clay platelets



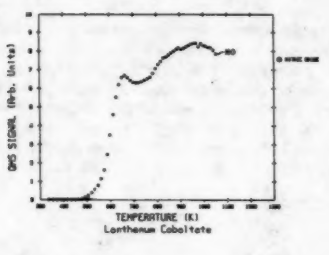
having an integral adjacent area of essentially amorphous alkali metal silicate base-kaolin clay reaction product.

4,812,300

SELECTIVE PEROVSKITE CATALYSTS TO OXIDIZE AMMONIA TO NITRIC OXIDE

Michael A. Quinlan, San Mateo, Calif.; Ramamurthy Ramanathan, South Burlington, Vt., and Henry Wise, Redwood City, Calif., assignors to SRI-International, Menlo Park, Calif.

Filed Jul. 13, 1987, Ser. No. 72,724
Int. Cl.[4] C01B *21/26*
U.S. Cl. 423—404 **11 Claims**



1. A process for the selective oxidation of ammonia to nitric oxide in about 90% or greater yield with a minimum of nitrogen or dinitrogen oxide (N_2O) as by-products, which process comprises:

(1) contacting gaseous ammonia in an oxygen containing gas optionally with an inert gaseous diluent with a mixed metal perovskite catalyst of the general formula: ABO_3, wherein:

A is selected from the alkali, alkaline earth, lanthanide, or actinide metals or a mixture of these metals having a relatively large ionic radius, and

B is selected from an element or a combination of elements selected from Groups IB, IVB, VB, VIB, VIIB or VIII of the Periodic Table, wherein the perovskite phase of the catalyst has an equilibrium partial pressure of oxygen at 1000° C. of greater than about 10^{-15} bar; and

(2) heating the reactants of step (1) at greater than about 500° C. under conditions of 10 to 100,000 hr^{-1} gas hourly space velocity.

4,812,301

PRODUCTION OF TITANIUM NITRIDE, CARBIDE, AND CARBONITRIDE POWDERS

Charles F. Davidson, Layton; Monte B. Shirts, South Jordan, and Donna D. Harbuck, Salt Lake City, all of Utah, assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Apr. 24, 1986, Ser. No. 855,276
Int. Cl.[4] C01B *31/34*
U.S. Cl. 423—440 **7 Claims**

1. A process for producing substantially oxygen-free titanium carbide consisting essentially of heating a gas phase reaction mixture of titanium halide, a reductant vapor selected from the class consisting of sodium and magnesium and a reactive gas capable of furnishing carbon at a temperature in the range from 500° to 1250° C., whereby the titanium halide is substantially simultaneously reduced and carbided for producing substantially oxygen-free titanium carbide in powder form having a particle size from about 0.1 to about 0.5 microns; said reductant vapor being present in said reaction mixture in an amount of from 75 to 200 percent by weight of the stoichiometric amount needed to reduce the titanium halide, and said reactive gas being present in said reaction mixture in an amount which is one to ten times the stoichiometric amount needed for reaction.

4,812,302

PROCESS FOR PREPARING HIGH PURITY MN_3O_4

William C. Laughlin, and Dwight A. Schulke, both of Edmond, Okla., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Jun. 15, 1987, Ser. No. 61,961
Int. Cl.[4] C01G *45/02*
U.S. Cl. 423—605 **11 Claims**

1. A process for preparing manganous-manganic oxide (Mn_3O_4) consisting of:

forming an aqueous slurry of particulate manganese metal suspended in an aqueous solution containing a water soluble salt of ammonium;

introducing an oxidizing agent into said aqueous slurry;

heating said aqueous slurry containing said oxidizing agent to a temperature of at least 30° C. for a period of time sufficient to oxidize said manganese metal; and

recovering the manganous-manganic oxide product.

4,812,303

HIGH DOSE CALCIUM TABLET

Theodore L. Iorio, Hingham, Mass., assignor to Copley Pharmaceuticals, Inc., South Boston, Mass.

Filed Apr. 3, 1986, Ser. No. 857,855
Int. Cl.[4] A61L *9/04*; A01N *59/06*
U.S. Cl. 424—44 **6 Claims**

1. An effervescent tablet that will dissolve rapidly in cool tap water or juice to yield a clear or almost clear solution consisting essentially of,

calcium carbonate,

fumaric acid, and

calcium lactate wherein said calcium carbonate and said fumaric acid are present in approximately molar equivalent amounts and said calcium lactate is present in an

amount sufficient to control the effervescence, allowing the tablet to dissolve completely without breaking apart and leaving any appreciable residue.

4,812,304

TREATMENT OF OSTEOPOROSIS

Colin Anderson, Lambeth, Canada, and Lawrence Flora, Fairfield, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 684,541, Dec. 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 605,539, Apr. 30, 1984, abandoned. This application Sep. 12, 1986, Ser. No. 906,858

The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.

Int. Cl.[4] H61K *35/55, 31/66*

U.S. Cl. 424—112 14 Claims

1. A method for treating or preventing osteoporosis in humans comprising administering to a subject afflicted with or at risk to osteoporosis a bone cell activating compound and a bone resorption inhibiting polyphosphonate according to a regimen consisting of one or more cycles, whereby each cycle consists of: (a) a bone activating period of from about 1 day to about 5 days during which a bone activating amount of a bone cell activating compound is administered daily to said subject; followed by (b) a bone resorption inhibition period of from about 10 days to about 20 days during which ethane-1-hydroxy-1,1-diphosphonic acid, or a pharmaceutically-acceptable salt or ester thereof, is administered daily to said subject in an amount of from about 0.25 mgP/kg/day to about 3.3 mgP/kg/day; followed by (c) a rest period of from about 70 days to about 180 days during which the subject receives neither a bone cell activating compound nor a bone resorption inhibiting polyphosphonate.

4,812,305

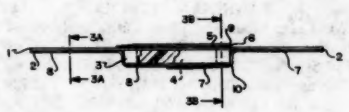
WELL MEDICINE STRIP

Rodolfo S. Vocal, P.O. Box 637, Mansfield, Ohio 44901-0637

Filed Nov. 9, 1987, Ser. No. 118,609

Int. Cl.[4] A61F *13/02*

U.S. Cl. 424—448 10 Claims



1. An adhesive bandage comprising:

(a) a flexible strip having an adhesive coating on one side;

(b) a generally doughnut shaped foam block member having a central aperture extending therethrough for receiving medication and supplying said medication to a site of the skin requiring medication, said central aperture being open at its top and bottom, said foam block member being adhered to said flexible strip via said adhesive coating, said foam block member being shorter than and not wider than said flexible strip and being positioned on said flexible strip so that both ends of said flexible strip extend beyond said block member;

(c) said flexible strip having an aperture in registry with the central aperture of said foam block member;

(d) a flexible flap for covering said aperture of said block member, said flexible flap having an adhesive coating on one side and being adhered via said adhesive coating to the uncoated side of said flexible strip; and

(e) a pair of release sheets for covering said adhesive coating on said flexible strip.

4,812,306

TOOTHPASTE OR DENTAL CREAM COMPOSITION AND METHOD OF PREPARING SAME

Francis E. Cocherell, 809 Silver Maple Dr., Azusa; Homer C. Harper, 15102 E. Chetney, Baldwin Park, both of Calif. 91702, and George Hsieh, 23943 Sunset Crossing Rd., Diamond Bar, Calif. 91765

Continuation of Ser. No. 819,583, Jan. 17, 1986, abandoned. This application Dec. 21, 1987, Ser. No. 139,064

Int. Cl.[4] A61K *7/26, 7/18*

U.S. Cl. 424—52 8 Claims

1. A chemically stable anhydrous toothpaste or dental cream composition, comprising:

(a) a powdery mixture of about 10% to about 90% by total weight of the composition of non-ionic sodium bicarbonate, about 0.02% to about 25% by total weight of the composition of a flavoring oil including flavoring oil extracts selected from the group consisting of anise oil, clove oil, sassafrass, peppermint, eugenol, Pemiento Gordo and mixtures thereof, about 0.001% to about 3.5% by total weight of the composition of a fluoride containing compound selected from the group consisting of sodium fluoride, potassium fluoride and ammonium fluoride, about 0.1% to about 60% by total weight of the composition of glycerin, about 0.01% to about 5% by total weight of the composition of a sweetener selected from the group consisting of saccharin and aspartame, about 0.01% to about 5% by total weight of the composition of sodium lauryl sulfate and about 0.2% to about 25% by total weight of the composition of corn starch,

(b) said powdery mixture being uniformly present in about 6% to about 90% by total weight of the composition in an hydrogenated vegetable oil carrier selected from the group consisting of sunflower oil, soybean oil and coconut oil, said vegetable oil carrier and said powdery mixture having been whipped together to a desired cream or paste consistency.

4,812,307

CROSSLINKING OF HAIR THIOLS USING GLUTATHIONE DISULFIDE

Patricia Sluta-Mangano, Valley Cottage, N.Y., assignor to Chesebrough-Pond's Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 69,929, Jul. 6, 1983. This application Jul. 16, 1987, Ser. No. 74,207

Int. Cl.[4] A61K *7/090, 7/06;* A45D *7/04*

U.S. Cl. 424—71 5 Claims

1. A process for treating keratinous material in which disulfide linkages have been ruptured to form sulfhydryl groups by the action of a reducing agent which comprises contacting said keratinous material with an amount of glutathione disulfide effective to crosslink an amount of sulfhydryl groups sufficient to set the keratinous material.

4,812,308

HYDROGEN PEROXIDE-RELEASING TOOTH POWDER

Anthony Winston, East Brunswick; Herman Marder, Red Bank, and Wayne Sorenson, Belle Mead, all of N.J., assignors to Church & Dwight Co., Inc., Princeton, N.J.

Filed Feb. 20, 1987, Ser. No. 17,143

Int. Cl.[4] A61K *7/16, 7/18, 9/20*

U.S. Cl. 424—52 20 Claims

1. A tooth powder, comprising at least 40% by weight of a mixture of sodium bicarbonate and sodium percarbonate, the percarbonate being present in an amount sufficient to release from 0.5 to 5% hydrogen peroxide by weight of the tooth powder, upon contact with water.

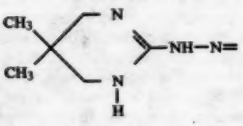
4,812,309

GEL INSECTICIDAL COMPOSITIONS

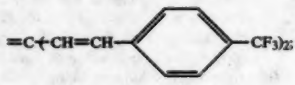
Chungjian J. Ong, Somerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 764,363, Aug. 12, 1985, abandoned. This application Jun. 26, 1986, Ser. No. 878,911
Int. Cl.[4] A01N *25/00*
U.S. Cl. 424—84 6 Claims

1. An insecticidal gel composition comprising on a weight basis 14% to 22% of the gellant α-hydro-Ω-hydroxy-poly(oxyethylene)poly(oxypropylene)poly(oxyethylene) block copolymer having an average molecular weight 12,500, mp 56° C., Brookfield viscosity of 3100 at 77° C., and surface tension of a 0.1% aqueous solution: 40.6 dynes/cm; 0.15% to 0.5% propyl p-hydroxybenzoate; 0% to 30% propylene glycol; 0.5% to 6% of a C_{17}–C_{19} unsaturated fatty acid; a C_7–C_{17} saturated fatty acid or a mixture of the fatty acids; 1% to 5% of formula (I) insecticide:



(I)



10% to 40% high fructose (55%) corn syrup; 0% to 10.0% isopropyl alcohol; 0.2% to 0.5% methyl p-hydroxybenzoate; and 25% to 60% of water; the composition having water to gellant ratios of 2.3/1 to 3.0/1 and a viscosity of 1.4×10^6 centipoise to 2.1×10^6 centipoise in a temperature range of 25° C. to 45° C.

4,812,310

PRESERVING SOLUTION FOR BLOOD OR PACKED BLOOD CELLS AND METHOD FOR PRESERVING BLOOD OR PACKED BLOOD CELLS BY USING THE SAME

Toru Sato, 2560, Hatagasaki, Yonago-shi, Tottori-ken; Naoto Okazaki, Yonago, and Katsumi Hiyoshi, Hamada, all of Japan, assignors to Toru Sato, Yonago, Japan

Filed Aug. 24, 1987, Ser. No. 88,450
Claims priority, application Japan, Aug. 29, 1986, 61-204269
Int. Cl.[4] A61K *35/14;* A01N *1/02*
U.S. Cl. 424—101 10 Claims

1. In a preserving solution for blood or packed blood cells comprising an anticoagulant solution containing citric acid, sodium citrate and glucose, the improvement comprising adding to said anticoagulant solution 0.5 to 1.5 w/v % of glycerin and 0.1 to 1.0 w/v % of mannitol, on the basis of the volume of blood or packed blood cells to be preserved.

5. In a method for preserving blood or packed blood cells comprising adding to blood or packed blood cells a preserving solution comprising an anticoagulant solution containing citric acid, sodium citrate and glucose and storing the blood or packed blood cells at a low temperature, the improvement comprising adding to said anticoagulant solution 0.5 to 1.5 w/v % of glycerin and 0.1 to 1.0 w/v % of mannitol, on the basis of the volume of blood or packed blood cells to be preserved, and storing said blood or packed blood cells at a temperature between the freezing temperature of plasma and 3° C.

4,812,311

KIT FOR USE IN THE TREATMENT OF OSTEOPOROSIS

Vernon A. Uchtman, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 684,560, Dec. 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 605,540, Apr. 30, 1984, abandoned. This application Sep. 12, 1986, Ser. No. 906,859
The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.
Int. Cl.[4] A61K *31/66, 35/55*
U.S. Cl. 424—112 17 Claims

1. A kit for use in a regimen for treatment or prevention of osteoporosis, said regimen comprising sequential administration of a bone cell activating compound, a bone resorption inhibition polyphosphate, and a placebo, or a nutrient supplement, said kit containing the following components:

(a) from 1 to about 5 daily doses of a bone cell activating amount each of a bone cell activating compound;

(b) from about 10 to about 20 daily doses of from about 0.25 mgP/kg/day to about 3.3 mgP/kg/day of ethane-1-hydroxy-1,1-diphosphonic acid, or a pharmaceutically-acceptable salt or ester thereof;

(c) from about 30 to about 100 daily doses of a placebo or a nutrient supplement;

and a means for having the components arranged in a way as to facilitate compliance with the regimen.

4,812,312

LIPOSOME-INCORPORATED NYSTATIN

Gabriel Lopez-Berestein; Reeta Mehta; Roy L. Hopfer, and Rudolph L. Juliano, all of Houston, Tex., assignors to Board of Regents of the University of Texas System, Austin, Tex.

Filed Mar. 3, 1987, Ser. No. 21,367
Int. Cl.[4] A61K *37/22, 37/00;* A61J *5/00;* B32B *5/16*
U.S. Cl. 424—417 13 Claims

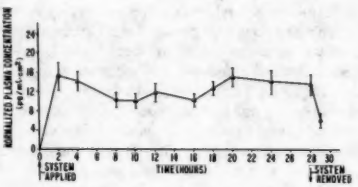
1. A method for treating systemic fungal infection in an animal comprising parenterally administering to said animal a fungicidally effective amount of a multilamellar liposome comprising nystatin one or more phospholipid.

4,812,313

METHOD FOR LESSENING THE INCIDENCE OF ANGINAL ATTACKS

Robert M. Gale, Mountain View, Calif., assignor to ALZA Corporation, Palo Alto, Calif.

Division of Ser. No. 278,364, Jun. 29, 1981, Pat. No. 4,725,272. This application Dec. 14, 1987, Ser. No. 132,829
Int. Cl.[4] A61K *9/00;* A01N *25/12*
U.S. Cl. 424—448 5 Claims



1. A method for lessening the incidence of anginal attacks in a patient, which method comprises:

(a) positioning on the skin of a patient prone to anginal attacks, a medical bandage comprising:

(1) a backing member that is substantially impermeable to the passage of drug;

(2) a reservoir in contact with the backing member, the reservoir comprising gelled silicone fluid, silicon diox-

ide, and a vasodilator useful as a prophylactic antianginal drug; and

(3) a rate controlling membrane in contact with the reservoir, which membrane is permeable to the passage of the vasodilator, controls its rate of release from the bandage, and is in contact with the backing member; and,

(b) administering transdermally the vasodilator in a prophylactically effective amount for producing the intended benefit.

4,812,314

LIPID REPLACEMENT THERAPY

Yechezkel Barenholz, Jerusalem, Israel, and Elishalom Yechiel, Baltimore, Md., assignors to Yissum Research & Dev. Co. of the Hebrew Univ. of Jerusalem and Hadassah Medical Organization, Israel

Filed Feb. 24, 1986, Ser. No. 832,929

Int. Cl.[4] A61K *31/685, 37/22;* **B01J** *13/02*

U.S. Cl. 424—450 **3 Claims**

1. A method of increasing male fertility in a relatively aged breeding animal comprising

providing a suspension of liposomes containing substantially more phosphatidylcholine and substantially less SM than that found in heart tissue of an animal of about the same age, and

administering the suspension to the animal in an amount effective to produce, over a period of at least several days, a substantial decrease in the level of the serum creatine phosphokinase in the treated animal.

4,812,315

DIET PILLS

M. Hisham Tarabishi, P.O. 12901, Upper St. Clair, Pa. 15241

Filed May 14, 1987, Ser. No. 49,542

Int. Cl.[4] A61K *9/46*

U.S. Cl. 424—466 **12 Claims**

1. A diet pill comprising a very compactly folded sealed package of cellulose dialysis tubing material containing a material which produces gas and expands in size by unfolding to occupy a larger volume in the stomach and gives the feeling of fullness as the result of reaction with gastric joice and liquid in the user's stomach upon swallowing the pill.

4,812,316

PROCESS FOR THE PREPARATION OF STABILIZED ISOSORBIDE-5-MONONITRATE TABLETS, BEING ALSO OF SUSTAINED RELEASE, AND FORMULATIONS THUS OBTAINED

Piergiorgio Rossi, Milan, and Massimo Calanchi, Monza, both of Italy, assignors to Eurand Italia S.p.A., Monza, Italy

Filed Oct. 14, 1986, Ser. No. 918,385

Claims priority, application Italy, Oct. 15, 1985, 22493 A/85

Int. Cl.[4] A61L *15/03*

U.S. Cl. 424—468 **12 Claims**

1. Pharmaceutical formulation suitable for preparation of tablets for oral administration and release in the stomach which exhibit improved stability, hardness, and friability over an extended period as contrasted with tablets not containing polyvinylpyrrolidone (PVP), characterized by containing, besides excipients usually used in the preparation of tablets, isosorbide-5-mononitrate, in a therapeutically-effective dose, and (a) one or more types of hydroxypropylmethylcellulose in a quantity between about 20 and 80 percent of the tablet weight; and (b) polyvinylpyrrolidone (PVP) in a weight ratio with the isosorbide-5-mononitrate between about 1:5 and 5:1.

4,812,317

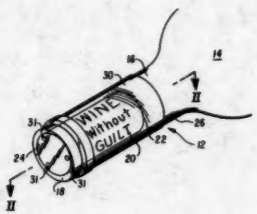
TRANSPARENT WINE BOTTLE CLOSURE AND CORK

Walter S. Taylor, Greyton H. Taylor Memorial Dr., Hammondsport, N.Y. 14840

Filed Dec. 15, 1987, Ser. No. 133,332

Int. Cl.[4] B65D *51/18*

U.S. Cl. 426—87 **14 Claims**



11. A bottle containing wine wherein potassium salts have not been removed by ion-exchange methods, the bottle comprising a bottle portion and an elongated generally cylindrical neck portion and an elongated cylindrical cork under compression in said neck portion, a continuous plastic closure over said neck portion and the top of said cork, potassium bitartrate crystals formed on the bottom of said cork in the interior of the bottle, said closure and said neck portion being composed of clear transparent material so that the outer surface of said cork in said neck portion and said potassium bitartrate crystals on the bottom of said cork are readily visible to an observer without the necessity of removing said cork.

4,812,318

CHOCOLATE ENROBED WAFER PRODUCTS AND METHOD FOR PREPARING THE SAME

Gilbert Finkel, Parsippany, N.J., assignor to Food-Tek, Inc., Morris Plains, N.J.

Filed May 12, 1987, Ser. No. 48,761

The portion of the term of this patent subsequent to May 12, 2004, has been disclaimed.

Int. Cl.[4] A23L *1/025;* **A23G** *1/00, 3/00*

U.S. Cl. 426—94 **12 Claims**

1. A method of producing a composite product comprising the steps of adding 0.2 to 5 wt. % of a liquid polyol to a flowable chocolate mixture after it has been tempered to form a composition having increased viscosity; forming said composition into a predetermined shape; preparing a subsantially nonaqueous batter; placing a quantity of said batter in contact with said shaped composition and briefly cooking said combined batter and composition in a microwave oven to set the batter to form a composite product.

4,812,319

METHOD FOR MAKING PACKAGE HAVING OIL-CONTAINING PRODUCT

Joseph C. Hsu, Neenah, and Robert A. Steen, Appleton, both of Wis., assignors to American National Can Company, Chicago, Ill.

Continuation of Ser. No. 773,085, Sep. 4, 1985, abandoned, which is a continuation of Ser. No. 611,482, May 17, 1984, abandoned, which is a division of Ser. No. 464,691, Feb. 7, 1983, Pat. No. 4,491,598. This application Jul. 6, 1987, Ser. No. 70,094

Int. Cl.[4] B65D *30/08;* **B32B** *27/08*

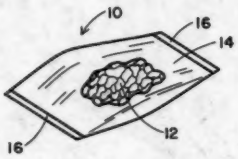
U.S. Cl. 426—127 **5 Claims**

1. A package, comprising:

(a) a product containing an oil; and

(b) a flexible sheet material having a plurality of layers and wherein the layers are adhered to each other, said sheet material having a first surface thereof on the exterior of said package and a second surface thereof on the interior

of said package and adjacent said product, said flexible sheet material comprising (i) a first layer of high density polyethylene, the thickness of said first layer being at least about 50% of the thickness of said sheet material, said product touching said sheet material at spaced locations, said high density polyethylene being susceptible to absorption of said oil and being susceptible to swelling at



corresponding spaced locations in said first layer upon absorption of said oil, such that said package is susceptible of exhibiting a cockled appearance, and (ii) a second layer of polypropylene as the layer on said second interior surface, said second layer of polypropylene being between said first layer and said product, said second layer of polypropylene functioning to reduce the susceptibility of said package to cockling.

4,812,320

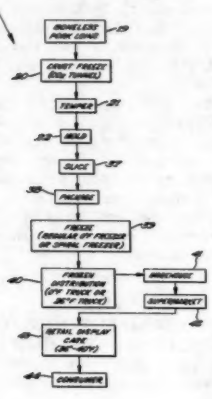
PROCESS FOR VACUUM PACKAGING FRESH MEAT PRODUCTS

David C. Ruzek, Austin, Minn., assignor to Geo. A. Hormel & Co., Austin, Minn.

Continuation of Ser. No. 859,701, May 5, 1986, abandoned. This application Apr. 28, 1988, Ser. No. 188,191

Int. Cl.[4] B65D *81/18, 81/20*

U.S. Cl. 426—393 **12 Claims**



1. A process for forming and packaging tray wrapped meat products to increase the shelf life of the products, prolong the color of the meat products, and minimize weepage, comprising:

placing a primal meat cut in a low temperature zone having a temperature of approximately −70° to −90° F. for a period of approximately 10 to 12 minutes to freeze only the crust of the cut to a depth of approximately ⅜ to ½ inch,

removing the crust frozen cut from the low temperature zone and immediately, in order to minimize thawing, placing the cut in a temperating zone having a temperature of approximately 24° F. to 28° F. for a period of approximately 8 to 12 hours until each cut is tempered and has an internal temperature of about 26° to 28° F.,

placing the tempered cut in a molding press and molding each cut into a predetermined shape while maintaining the internal temperature of the cut at a temperature of about 26° F. to 28° F.,

slicing the molded cut into slices of uniform predetermined thickness and similar shape while maintaining the internal temperature of the cut at a temperature of about 28° F. to 30° F. so that the cut is sliced when it is deep chilled,

placing a predetermined number of deep chilled meat slices upon the upper surface of a specific size tray formed of gas impervious plastic film of predetermined thickness,

applying a non-barrier film to the deep chilled meat slices and the tray to cover the deep chilled meat slices on the tray, while maintaining the temperature of the meat slices at approximately 28° F. to 30° F., so that gases produced by organisms in and on the meat slices may pass outwardly through the film, while oxygen may pass inwardly through the film, thereby aiding in the color retention and shelf life of the meat slices,

vacuum skin packaging the covered deep chilled meat slices so that the non-barrier film adheres tightly to all exposed surfaces of the deep chilled meat slices and adheres tightly to all portions of the upper surface of the tray not covered by the meat slices, thereby eliminating space for purge or weepage to occur and creating the impression that the meat slices are not covered by any packaging material,

placing

a plurality of said vacuum skin packaged

trays of meat slices into a box which is placed in a freezing chamber,

transporting at least one box of meat slices at about 0° F. or at about 24° to 28° F., maintaining the product in a frozen condition or at a temperature below 28° F.,

thawing the meat slices to a temperature of 34° to 38° F., and placing

said vacuum skin packaged trays containing said

thawed meat slices in a retail display case at a temperature of 34° to 40° F. so that the meat slices retain their red color for a period of 6 to 8 days after being placed in the retail display case.

4,812,321

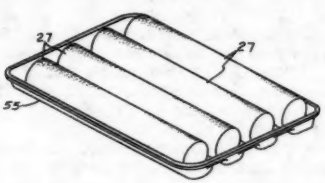
METHOD OF SUBDIVIDING DOUGH

David Vandervoort, Orange, and Monty Griffith, Fullerton, both of Calif., assignors to Bridgford Foods Corporation, Anaheim, Calif.

Division of Ser. No. 742,746, Jun. 19, 1985. This application Jul. 28, 1986, Ser. No. 890,130

Int. Cl.[4] A21D *6/00*

U.S. Cl. 426—503 **4 Claims**



1. A method of processing dough which comprises:

filling a throw away tray formed from lightweight plastic subdivided into a plurality of elongated channels by an upstanding inverted V-shaped portion of the bottom thereof with elongated loaves of dough;

subdividing each loaf of the dough into a plurality of individual portions while the dough is in the tray;

freezing the tray of subdivided loaves of dough; and

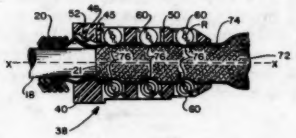
enclosing the frozen tray of subdivided dough in a protective wrapping for handling and transportation to a cite for sale and/or baking.

4,812,322

CHUCK FOR FOOD ENCASING MACHINE AND METHOD FOR STUFFING A CASING WITH FOOD EMULSION

James F. Bielanski, Oak Forest, and Keith A. Watts, Elmhurst, both of Ill., assignors to Viskase Corporation, Chicago, Ill.

Filed Apr. 13, 1988, Ser. No. 180,914
Int. Cl.[4] A22C 7/00
U.S. Cl. 426—513 **21 Claims**



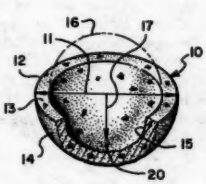
14. In a method for consecutively deshirring a shirred food casing and stuffing it with food emulsion while rotating the deshirring casing around a longitudinal axis and longitudinally moving the casing first through a progressively smaller diameter casing engaging zone while stuffing it with food emulsion and thereafter diametrically restricting the food emulsion-filled casing while moving it through a casing deforming zone wherein the improvement comprises the steps of gripping and driving the food emulsion-filled casing about its longitudinal axis by pressing rotatably against and inwardly deforming the food emulsion-filled casing at a plurality of circumferentially spaced locations around said longitudinal axis in each of a multiplicity of longitudinally spaced sub-zones in said casing deforming zone.

4,812,323

METHOD FOR PREPARING A CUP-SHAPED COOKIE

Don H. Savage, Sandy, Utah, assignor to Cookie Cup International, Sandy, Utah

Filed Dec. 5, 1986, Ser. No. 938,575
Int. Cl.[4] A21D 8/06, 13/08
U.S. Cl. 426—496 **5 Claims**



1. A method of preparing a concavo-convex shaped cookie, comprising the steps of:

(a) preparing a batter which bakes into a cookie;

(b) preparing a baking enclosure to receive the cookie batter, said enclosure including a baking void space bounded by upper and lower molds having forms characterized by the absence of interior corners and points and having a configuration shaped in a form representing a desired cupped shape;

(c) placing a portion of the batter in the baking void space;

(d) applying a differential cooking environment to the cookie batter comprising a greater quantity of cooking heat at an interior face of the lower mold which is in contact with the batter and a lesser quantity of cooking heat at an interior face of the upper mold which is in contact with the batter;

(e) maintaining the differential cooking environment for sufficient time to substantially cook the batter; and

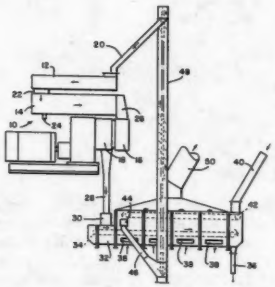
(f) separating the upper and lower molds to permit removal of the cooked batter.

4,812,324

MASH PELLETIZING METHOD

Henry Pierik, Forestville, Calif., assignor to California Pellet Mill Company, San Francisco, Calif.

Division of Ser. No. 790,612, Oct. 23, 1985. This application Mar. 23, 1987, Ser. No. 28,838
Int. Cl.[4] A23K 1/06, 3/00
U.S. Cl. 426—624 **2 Claims**



1. A method of making pellets from a mash comprising the steps of: pelleting pre-heated mash to thereby form warm pellets; cooling the warm pellets by ambient air to heat the ambient air; and pre-heating the mash with the heated ambient air: said warm moist pellets are moved in one direction as the pellets are cooled by the ambient air; and said mash is moved in the opposite direction in close parallel relationship to obtain counterflow heat exchange between said warm moist pellets and said mash as a means of moisture and heat conditioning of said mash.

4,812,325

METHOD FOR FORMING A DEPOSITED FILM

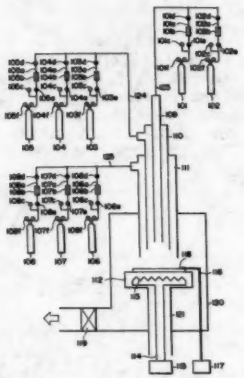
Shunichi Ishihara, Ebina; Junichi Hanna, and Isamu Shimizu, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1986, Ser. No. 921,197
Claims priority, application Japan, Oct. 23, 1985, 60-237005; Oct. 24, 1985, 60-238496
Int. Cl.[4] B05D 5/06, 5/12; C23C 16/00
U.S. Cl. 427—69 **24 Claims**

1. A method for forming a deposited film on a substrate in a reaction space, comprising:

introducing into said reaction space (a) a gaseous starting material for the formation of a deposited film, said gaseous starting material being selected from the group consisting of straight chain silane compounds represented by the formula Si_nH_{2n+2}, wherein n is an integer of 1 to 8; SiH_3-$SiH(SiH_3)SiH_2SiH_3$; and chain, germanium compounds represented by the formula Ge_mH_{2m+2} wherein m is an interger of 1 to 5 and (b) a gaseous oxidizing agent, said gaseous oxidizing agent being selected from the group consisting of air, oxygen, ozone, N_2O_4,N_2O_3, N_2O, NO and H_2O_2, to form a mixture and effect chemical contact therebetween and thereby form a plurality of precursors including precursors in an excited state; and

forming a deposited film on said substrate in said reaction space through a gas introducing conduit system without the use of external discharge energy with at least one of said precursors, said gas introducing conduit system including a plurality of coaxially aligned conduits each having an exit orifice with an outer conduit adapted to carry said gaseous oxidizing agent and at least one inner



conduit adapted to carry said gaseous starting material, said coaxially aligned conduits extending into the film forming space such that the exit orifice of the inner conduit is set back from the exit orifice of the outer conduit to enable the gaseous oxidizing agent in the outer conduit to surround the gaseous starting material exiting said inner conduit, said substrate positioned from 5 millimeters to 15 centimeters from the exit orifice of said outer conduit.

4,812,326

EVAPORATION SOURCE WITH A SHAPED NOZZLE

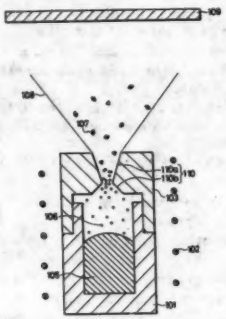
Hisashi Tsukazaki; Kenichiro Yamanishi, and Seiji Yasunaga, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1987, Ser. No. 14,318

Claims priority, application Japan, Aug. 22, 1986, 61-197595

Int. Cl.[4] B05D *3/06*; **B05B** *5/02*; **C23C** *16/00*

U.S. Cl. 427—38 **10 Claims**



7. A method of forming a thin film comprising the steps of:

heating an evaporation material to vaporize said evaporation material;

jetting said vaporized material through a nozzle toward a substrate to be deposited with said evaporation material, said jetting thereby forming clusters composed of a plurality of atoms of said evaporation material, said nozzle having an aperture with a diverging portion having a cross-section gradully enlarging in a direction toward said substrate:

ionizing said clusters to thereby form cluster ions;

acclerating said cluster ions toward said substrate to collide thereagainst to thereby form a thin film;

setting an opening angle of said diverging portion of said aperture to thereby adjust a thickness distribution of said thin film on said substrate;

wherein said setting step is accomplished by maintaining a plurality of nozzles having a same minimum diameter portion, respective nozzles in said plurality having an enlarging portion which differs from the enlarging portion of other respective nozzles in said plurality, and wherein said setting of an opening angle is accomplished by selecting one nozzle from said plurality; and

wherein said aperture of said nozzle additionally has a converging portion having a cross-section gradually decreasing in a direction toward said substrate, and additionally having a cylindrical portion having a substantially constant diameter, said cylindrical portion corresponding to said minimum diameter portion and connecting said diverging portion with said converging portion.

4,812,327

EMULSION-TYPE RUST PREVENTIVE BAKING COMPOSITION

Hideaki Hanazawa; Makoto Mori; Katsumi Sasaki, and Katsumi Inagaki, all of Osaka, Japan, assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 19,845, Feb. 27, 1987. This application Oct. 2, 1987, Ser. No. 104,141

Claims priority, application Japan, Mar. 11, 1986, 61-053285

Int. Cl.[4] B05D *3/02*

U.S. Cl. 427—388.4 **16 Claims**

1. A process for preventing rust formation on metal substrates, which comprises the steps of:

(a) coating the metal substrate with an aqueous polymer emulsion containing (i) a film forming polymer comprising at least one compound selected from the group consisting of carboxylated styrene-butadiene rubbers, carboxyl group containing acrylic copolymer, carboxyl group containing styrene-acrylic copolymers, glycidyl group containing acrylic copolymers, and glycidyl group containing styrene-acrylic copolymers, (ii) a heat fusible organic filler, and (iii) a bitumen emulsion in an amount of 5–100 parts by weight per 100 parts of the polymer solids in the aqueous polymer emulsion;

(b) predrying the coated substrate at a temperature at which the film-forming polymer will form a film but at which the heat fusible organic filler does not melt or soften; and

(c) baking the predried, film-coated substrate at a temperature at which the heat fusible organic filler melts or softens, the heat fusible organic filler having a melting or softening point within the range of 40° to 250° C., which temperature is higher by at least 50° C. than the film forming temperature of the film forming polymer present in the aqueous polymer emulsion.

4,812,328

METHOD FOR FORMING DEPOSITED FILM

Keishi Saitoh, Nabari; Masaaki Hirooka, Toride; Junichi Hanna, and Isamu Shimizu, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1986, Ser. No. 945,689

Claims priority, application Japan, Dec. 25, 1985, 60-295303

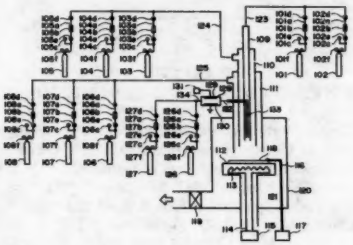
Int. Cl.[4] B05D *5/6, 5/12*

U.S. Cl. 427—69 **20 Claims**

1. A method for forming a deposited film by introducing into a reaction space having a substrate a non-activated gaseous starting material for formation of the deposited film and a non-activated gaseous halogenic oxidizing agent selected from group consisting of F_2, Cl_2, Br_2 and I_2 and having the property

of oxidation action on said non-activated gaseous starting material to form a deposited film on said substrate by a direct chemical reaction between said non activated gaseous starting material and said non-activated gaseous halogenic oxidizing agent, which comprises:

activating a gaseous substance (B) which includes a component to act as a band gap controller in an activation space



separate from said reaction space to form an activated species; and

introducing said activated species into the reaction space so as to form a mixture with said non activated gaseous starting material and said non activated gaseous halogenic oxidizing agent and form a deposited film controlled in band gap on said substrate without the use of external discharge energy in the reaction space.

4,812,329

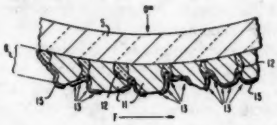
METHOD OF MAKING SULFUR TOLERANT COMPOSITE CERMET ELECTRODES FOR SOLID OXIDE ELECTROCHEMICAL CELLS

Arnold O. Isenberg, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 867,860, May 28, 1986, Pat. No. 4,702,971. This application Jul. 13, 1987, Ser. No. 72,834

Int. Cl.[4] B05D *5/12*; H01M *8/10*

U.S. Cl. 427—115 **4 Claims**



1. A method of bonding a separate, porous, active layer on an electronically conductive fuel cell electrode attached to a solid electrolyte, oxygen ion transporting oxide layer comprising the steps:

(A) forming a coating of particles of an electronic conductor selected from the group consisting of nickel, cobalt, and mixtures thereof on a first surface of an oxygen ion transporting, solid oxide electrolyte layer comprising zirconia;

(B) applying a source of oxygen to a second surface of said solid oxide electrolyte layer;

(C) applying a metal halide vapor to said first surface of said solid oxide electrolyte layer;

(D) heating said oxygen transporting, solid oxide electrolyte layer to a temperature sufficient to induce oxygen to diffuse through said oxide layer and react with said metal halide vapor, whereby essentially only an ion conductive metal oxide skeletal structure, comprising zirconia, grows partially around said particles of said electronic conductor, embedding them, and forming an electrode attached to the electrolyte;

(E) coating both the particles and the ion conducting metal oxide skeletal structure with a separate, salt coating which upon heating will form an oxide selected from the group consisting of ceria, doped ceria, uranium oxide, doped uranium oxide, and mixtures thereof; and then

(F) heating the salt coated structure at a temperature of from about 500° C. to about 1400° C., to form a separate, porous, ionic-electronic conductive, active coating comprising an oxide selected from the group consisting of ceria, doped ceria, uranium oxide, doped uranium oxide, and mixtures thereof, where the ionic-electronic conductive coating formed in step (F) is effective to provide electrochemically active sites over its entire surface, and where the heating in step (F) is effective to diffuse elements from the salt coating into the skeletal structure, introducing increased electronic conduction into the skeletal structure.

4,812,330

PROCESS FOR PRODUCING A MAGNETIC RECORDING MEDIUM

Tadashi Ishikuro, and Masaaki Fujiyama, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 2, 1988, Ser. No. 188,942

Claims priority, application Japan, Apr. 30, 1987, 62-104492

Int. Cl.[4] H01F *10/02*

U.S. Cl. 427—128 **10 Claims**

1. A process for producing a magnetic recording medium which comprises uniformly dispersing an α—Al_2O_3 powder having a particle size of not greater than 0.1 μm in a dispersion medium to obtain a dispersion, adding the dispersion to a coating composition for a magnetic layer essentially comprising a binder and a ferromagnetic powder having a specific surface area of not less than about 40 m^2/g, further dispersing the mixture to prepare a coating composition for a magnetic layer, and then coating the resulting coating composition on a nonmagnetic support to obtain a magnetic layer having a dry thickness of about 2 μm or less.

4,812,331

METHOD FOR FORMING DEPOSITED FILM CONTAINING GROUP III OR V ELEMENT BY GENERATING PRECURSORS WITH HALOGENIC OXIDIZING AGENT

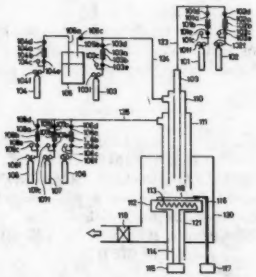
Masaaki Hirooka, Toride; Masao Ueki, Urayasu; Jun-Ichi Hanna, and Isamu Shimizu, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1986, Ser. No. 942,210

Claims priority, application Japan, Dec. 16, 1985, 60-282202

Int. Cl.[4] C23C *16/00*

U.S. Cl. 427—255.1 **6 Claims**



1. A method for forming a deposited film on a substrate in a reaction space comprising:

introducing into a reaction space using a gas introducing

conduit system (a) a gaseous starting material for formation of a deposited film, and (b) a gaseous halogenic oxidizing agent capable of oxidizing said starting material; said gaseous starting material being selected from the group consisting of compounds containing a Group III element, compounds containing a Group V element, and mixtures thereof; said gaseous halogenic oxidizing agent being selected from the group consisting of F_2, Cl_2, Br_2 and I_2 said gas introducing conduit system including a plurality of coaxially aligned conduits each having an exit orifice with an outer conduit adapted to carry said gaseous halogenic oxidizing agent and at least one inner conduit adapted to carry said gaseous starting material, said coaxially aligned conduits extending into the film forming space such that the exit orifices of the inner conduits are set back from the exit orifice of the outer conduit to enable the gaseous halogenic oxidizing agent in the outer conduit to surround the gaseous starting material exiting said inner conduit, said substrate positioned from 5 millimeters to 15 centimeters from the exit orifice of said outer conduit;

allowing said gaseous starting material and said gaseous halogenic oxidizing agent to contact each other thereby forming a plurality of precursors including precursors in an exicted state; and

forming said deposited film on said substrate without the use of external discharge energy in the reaction space using at least one of said precursors.

4,812,332

METHOD FOR FORMING A COATED SUBSTRATE

Jean-Pierre Kerherve, 28 bis, Chemin des Fonceaux Linas, 91310 Monthlery, and Armel Querornes, Appr. 123-Residence du Foulon, 91120 Villebon Sur Yvette, both of France

Division of Ser. No. 765,739, Aug. 14, 1985, Pat. No. 4,694,091. This application Jul. 27, 1987, Ser. No. 64,022

Claims priority, application France, Aug. 22, 1984, 84 13069

Int. Cl.[4] B05D *5/06, 5/12*

U.S. Cl. 427—168 **14 Claims**

1. A method for depositing tin oxide upon a substrate which comprises:

preparing a dibutyl tin difluoride powder by a method comprising

reacting dibutyl tin chloride and an ammonium difluoride to form dibutyl tin difluoride;

forming a solution of said dibytl tin difluoride,

adding a refractory powder to said solution to act as a recrystallization initiator,

cooling the solution to recrystallize the dibutyl tin difluoride, and

recovering a dibutyl tin difluoride product having spherical grains and being free of alkaline earth and alkali impurities;

providing a heated substrate; and

depositing the dibutyl tin difluoride powder upon a surface portion of said heated substrate so as to pyrolyze the powder, thus coating the desired surface portion with tin oxide.

4,812,333

SULFIDE THIN FILM FORMED FROM STABILIZED METALLO-ORGANIC SOLUTION

Adolph L. Micheli, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 2, 1988, Ser. No. 189,081

Int. Cl.[4] B05D *3/02*

U.S. Cl. 427—226 **9 Claims**

1. A method for producing a metal sulfide thin film comprising

applying onto a substrate a stabilized solution comprising a thermally decomposable metallo-organic compound and elemental sulfur dissolved in a vaporizable solvent, said metallo-organic compound selected from the group consisting of mercaptides and thiocarboxylates

evaporating the solvent to a deposit comprising the metallo-organic compound and the sulfur, and

heating the deposit while exposed to an inert atmosphere to a temperature sufficient to decompose the metallo-organic compound to form a metal sulfide thin film.

4,812,334

PROCESS FOR SEALING CERAMIC HEAT EXCHANGERS

Otmar Linsner, Ratingen, and Karl Berroth, Düsseldorf, both of Fed. Rep. of Germany, assignors to Hoechst CeramTec Aktiengesellschaft, Selb, Fed. Rep. of Germany

Filed Nov. 19, 1987, Ser. No. 123,271

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1986, 3639880; May 26, 1987, 3717670

Int. Cl.[4] B05D *3/02, 3/12*

U.S. Cl. 427—369 **11 Claims**

1. A process for sealing a ceramic heat exchanger having narrow cross-sections, which comprises filling the cold side of the heat exchanger with a liquid synthetic resin and generating there a pressure higher than that on the hot side of the heat exchanger, removing the excess resin and fully curing the synthetic resin.

4,812,335

METHOD OF PAINTING

Teruaki Kuwajima, Higasiosaka; Kazuo Uenoyama, Osaka; Masaki Takae, Suita, and Hidefumi Okuda, Toyonaka, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Oct. 23, 1987, Ser. No. 111,808

Claims priority, application Japan, Oct. 27, 1986, 61-256591

Int. Cl.[4] B05D *1/36, 7/00*

U.S. Cl. 427—407.1 **9 Claims**

1. A method of painting comprising:

coating, on a substrate provided with undercoat or intermediate coat, a water borne metallic paint made of resin composition (I) comprising;

(A) 94 to 30 parts by weight of vinyl copolymer having an acid value of 5 to 100, a hydroxyl value of 20 to 100, a solubility parameter (δsp) of 9.0 to 13.0 and a number average molecular weight of 3,000 to 50,000, and which is prepared by copolymerizing an ethylenic monomer having an acid group, an ethylenic monomer having a hydroxyl group and another ethylenic monomer copolymerizable therewith,

(B) 5 to 40 parts by weight of a crosslinking component reactive with component (A), and

(C) 1 to 30 parts by weight of swelled resin particles swelled with an organic solvent having a solubility parameter of 7.5 to 13.0, and the resin particles having an average particle size of 0.01 to 10μ:

then coating thereon, without curing the water borne metallic paint film, a thermosetting clear paint made of resin composition (II) comprising;

(D) 95 to 60 parts by weight of a copolymer having a hydroxyl value of 20 to 100 and an absolute value of a difference of solubility parameter between said copolymers (A) and (D), of not less than 0.3, and which is prepared by copolymerizing an ethylenic group having a hydroxyl group and another ethylenic monomer copolymerizable with said monomer, and;

(E) 5 to 40 parts by weight of a crosslinking component reactive with the component (D).

4,812,336

PROCESS FOR THE PRODUCTION OF PATTERNED DECORATIVE MATERIALS

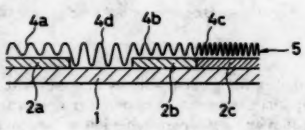
Shingo Okamoto, Fuzisawa; Masao Kiryu, Zushi, and Atsushi Yoshida, Yokohama, all of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1988, Ser. No. 165,284

Claims priority, application Japan, Mar. 23, 1987, 62-68393; Jun. 15, 1987, 62-148780; Jun. 15, 1987, 62-148781; Jul. 27, 1987, 62-187246; Jul. 27, 1987, 62-187247

Int. Cl.[4] B05D 5/00

U.S. Cl. 427—257 7 Claims



1. A process for the production of patterned decorative materials having a coating exhibiting crepe-like relieved patterns, comprising, printing on the surface of a substrate a selected pattern with an ink and then coating over the thus-printed substrate with a wrinkle paint to form a coating with crepe-like relieved patterns corresponding to said selected ink pattern.

4,812,337

METALLIC COATING METHOD

You Sugimura, Odawara; Nobushige Numa, Ebina; Tadashi Watanabe, Hiratsuka; Yutaka Sugiyama, Ayase; Kazuhiko Ohira, Nagoya, and Sachio Yamaguchi, Hiratsuka, all of Japan, assignors to Kansai Paint Company, Limited, Amagasaki, Japan

Filed Nov. 18, 1987, Ser. No. 122,721

Claims priority, application Japan, Nov. 25, 1986, 61-281362; Dec. 29, 1986, 61-313266

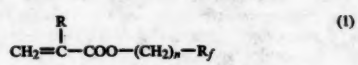
Int. Cl.[4] B05D 1/36, 7/00

U.S. Cl. 427—407.1 6 Claims

1. A metallic coating method for forming a metallic coat, comprising the steps of:

(1) applying to a substrate a base coating composition containing a metallic pigment; and

(2) applying a clear top coating composition on top of the base coating composition, said clear top coating composition being a curable composition consisting essentially of a non-aqueous dispersion of particlels of a polymer of a radically polymerizable monomer, said particles being dispersed in a nonaqueous medium which consists essentially of a solution of a dispersion stabilizer in a non-aqueous solvent, wherein said dispersion stabilizer is a fluorine-cotaining copolymer containing 5–40 percent by weight of a hydroxyl group-containing monomer and 1–80 percent by weight of a perfluoroalkyl group-containing acrylic or methacrylic monomer represented by the formula (1)



(1)

wherein R is a hdyrogen atom or a methyl group, n is an integer of 1 to 11, and R_f is a straight chain or branched chain perofluoroalkyl group having 1–21 carbon atoms,

wherein the amount of the dispersion stabilizer is 5–80 percent by weight, based on the combined amount of the radically polymerizable monomer and the dispersion stabilizer.

4,812,338

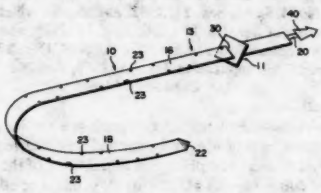
COMBINATION OF ARTIFICIAL FLOWER-FORMING RIBBON AND TACK PLATE

Kosuke Masui, Nagoya, Japan, assignor to Kabushiki Kaisha Aoyama, Nagoya, Japan

Continuation-in-part of Ser. No. 929,555, Nov. 12, 1986, Pat. No. 4,725,461. This application Nov. 10, 1987, Ser. No. 120,252

Int. Cl.[4] A41G 1/00; D04D 7/10

U.S. Cl. 428—4 10 Claims



1. In combination, an artificial flower-forming ribbon and a tack plate therefor, comprising:

an artificial flower-forming ribbon having a pair of strips overlapped with respect to each other and at least one string disposed along and interposed between said pair of strips, said at least one string being joined to one end of each of said strips at one end thereof, said strips being adhered to each other at at least two portions on each of a plurality of lines spaced apart in the longitudinal direction of said strips so as to permit relative movement of said strips and said at least one string interposed between said strips; and

a tack plate including a slit, extending from a central portion of said tack plate to a peripheral edge portion of said tack plate, through which either said pair of strips or said at least one string is passed, and adhesive means provided upon one surface of said tack plate for securing said tack plate to a support surface.

4,812,339

ARTIFICIAL SOIL AND CONSTRUCTION OF BED SOIL FOR PUTTING GREEN USING ARTIFICIAL SOIL

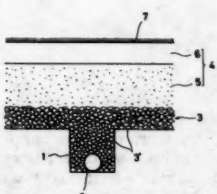
Masashi Shibata, Kume; Iwao Hayakawa, Akaiwa, and Tokimasa Hayashibara, Kume, all of Japan, assignors to Nisshoku Corporation, Okayama, Japan

Filed Jul. 1, 1987, Ser. No. 69,529

Claims priority, application Japan, Oct. 21, 1986, 61-251542

Int. Cl.[4] A01N 1/00; A41G 3/00

U.S. Cl. 428—15 2 Claims



1. An artificial soil formed of a mixture comprising 2.5 parts by volume shirasu, 2.25 parts by volume peat or rotted bark compost, 0.25 parts by volume shellfish fossil, 0.25 parts by volume coral fossil, and 0.1 parts by volume of a mixture of polyethylene oxide and vermiculite.

4,812,340

SIMULATED DESERT VARNISH PRODUCTS AND METHODS OF MAKING SAME

Jerry D. Cripe, 2445 S. Catarina, Mesa, Ariz. 85202

Division of Ser. No. 828,142, Feb. 7, 1986, Pat. No. 4,725,451, which is a continuation of Ser. No. 762,794, Aug. 2, 1985, abandoned, which is a continuation of Ser. No. 689,501, Jan. 8, 1985, abandoned, which is a continuation of Ser. No. 598,394, Apr. 9, 1984, abandoned, which is a continuation of Ser. No. 517,468, Jul. 26, 1983, abandoned, which is a continuation of Ser. No. 418,556, Sep. 15, 1982, abandoned, which is a continuation of Ser. No. 071,506, Aug. 31, 1979, abandoned, which is a continuation of Ser. No. 865,455, Dec. 29, 1977, abandoned. This application Jan. 11, 1988, Ser. No. 142,423

Int. Cl.[4] B05C 1/16

U.S. Cl. 428—15 8 Claims

1. A composition of matter comprising a stable, insoluble rock substrate having a coating applied to a scarred surface thereof, said coating comprising an initial layer of the reaction product of said rock with a 0.05N to 5N solution of alkali bases and a finishing cover comprising the reaction product of said initial layer with a 0.05N to 4N solution of metallic salts selected from the salts of iron and manganese.

4,812,341

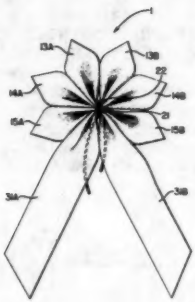
FLOWER-LIKE ORNAMENT

Raphael Etzion, Great Neck, N.Y., assignor to Variety Accessories, Inc., Great Neck, N.Y.

Filed Jan. 19, 1988, Ser. No. 145,461

Int. Cl.[4] A41G 1/00

U.S. Cl. 428—24 15 Claims



1. A flower-like ornament comprising:

a plurality of adjacently arranged elongated strips of material, each strip of material being connected to an adjacent strip of material over a limited area central of said strip, said limited areas of connection of said strips being in substantial alignment,

the strips being creased along their lengths and being compressed and held together at a common region aligned with said limited areas of connection of said strips, whereby the portions of the strips extending oppositely from the common region form petal-like shapes and together a flower-like configuration.

4,812,342

PROCESS FOR GASSING SOILS

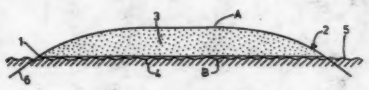
Hartmut Linde, Fallingbostel, and Reinhold Mende, Walsrode, both of Fed. Rep. of Germany, assignors to Wolff Walsrode AG, Walsrode, Fed. Rep. of Germany

Filed Dec. 11, 1986, Ser. No. 940,322

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1985, 3544308

Int. Cl.[4] B65D 33/16, 33/01

U.S. Cl. 428—35.4 10 Claims



1. A container for gassing soils with gaseous biologically active compounds, wherein the container comprising a gas-tight upper film and a gas-permeable lower film joined to the upper film at its edges to form the container and a closable filling aperture disposed in the upper film.

4,812,343

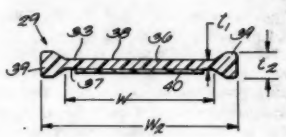
PULTRUDED FIBER REINFORCED PLASTIC MARKING DEVICES

John H. Kiekhaefer, Milwaukee; Jack E. Perko, Cedarburg; Joseph S. Hetzer, Milwaukee, all of Wis., and Frank W. Harris, Akron, Ohio, assignors to W. H. Brady Co., Milwaukee, Wis.

Filed Jan. 27, 1988, Ser. No. 148,813

Int. Cl.[4] B32B 5/06; B29C 67/00

U.S. Cl. 428—35.6 18 Claims



1. A pultruded fiber reinforced marking device of fiber reinforcement material embedded in a cured plastic resin matrix of a formulation including unsaturated polyester resin, characterized in that

(a) unidirectional reinforcement material comprises about 30% to 60% of the total weight of the marking device,

(b) bidirectional reinforcement material, multidirectional reinforcement material, or a combination thereof, comprises about 0.5% to 15% of the total weight of the marking device, and

(c) the resin matrix comprises the balance by weight of the marking device and includes

(1) polyester resin, and

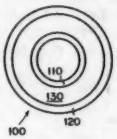
(2) finely-divided cellulose solid particulates in an amount providing a formulation for the resin matrix having a viscosity in the range of about 1,000 to 5,000 centipoises at an ambient temperature of 70° F. prior to being cured.

4,812,344

COMPOSITE CAPILLARY TUBE STRUCTURE AND METHOD OF FORMING

Raymond E. Jaeger, and Mohd Aslami, both of Sturbridge, Mass., assignors to Spectran Corporation, Sturbridge, Mass.

Filed Mar. 28, 1988, Ser. No. 173,952
Int. Cl.[4] C03B 23/13
U.S. Cl. 428—34.6 16 Claims



1. A composite capillary tube structure made of a plurality of glass layers comprising:

inner and outer layers of a first glass material separated by an intermediate layer of a second glass material having a higher coefficient of thermal expansion than that of said first glass material, so that the inner and outer layers are maintained under a compressive force over a temperature range of up to about 400° C.

8. A method of making a composite capillary tube structure having a plurality of glass layers, which method comprises:

forming a preform of a concentric tube comprising inner and outer layers of a first glass material separated by an intermediate layer of a second glass material having a higher coefficient of thermal expansion than that of said first glass material;

heating said preform to a sufficient temperature to soften the glass materials;

drawing a composite capillary tube structure from said heated preform; and

cooling said tube structure to develop stresses between said layers, so that the inner and outer layers are maintained under compressive force over a temperature range of up to about 400° C.

4,812,345

OPTICAL DISK SUBSTRATE

Shozaburo Imai, Toyonaka, Japan; Michihisa Isobe, Dusseldorf, Fed. Rep. of Germany; Kazuhiro Yokoo, and Hideaki Matsuura, both of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 35,882, Apr. 8, 1987, abandoned. This application Feb. 11, 1988, Ser. No. 155,109
Claims priority, application Japan, Apr. 14, 1986, 61-85804
Int. Cl.[4] G11B 7/24
U.S. Cl. 428—65 2 Claims

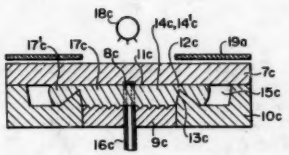
1. An optical disk substrate comprising a copolymer produced by polymerizing 50 to 65% by weight of methyl methacrylate (a) units, 20 to 35% by weight of tricyclo[5.2.1.$0^{2,6}$]deca-8-yl methacrylate (c) units, 5 to 25% by weight of cyclohexyl methacrylate (c) units and 1 to 5% by weight of acrylic ester (d) units.

4,812,346

OPTICAL DISC BASE PLATE AND PROCESS FOR PRODUCING THE SAME

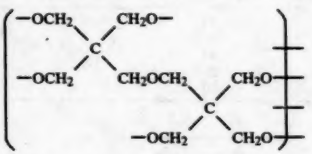
Ryoichi Sudo, Yokosuka; Hiroaki Miwa, and Tetsuo Tajima, both of Fujisawa, all of Japan, assignors to Hitachi Ltd. and Hitachi Maxwell Ltd., both of Tokyo, Japan

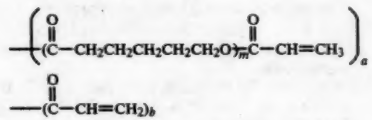
Filed Jul. 22, 1986, Ser. No. 888,051
Claims priority, application Japan, Jul. 26, 1985, 60-164169; Aug. 20, 1985, 60-181119
Int. Cl.[4] C08F 2/50, 20/58, 20/20; B32B 3/02
U.S. Cl. 428—65 9 Claims



1. An optical disc base plate made from a casting of light-cured resin composition consisting essentially of:

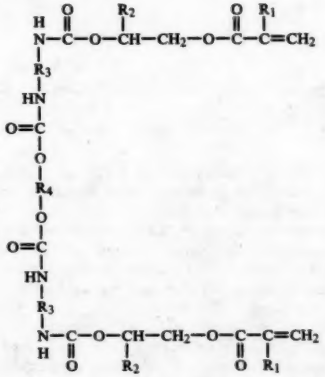
(i) a compound (1) represented by the formula:



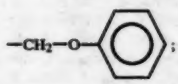


wherein m=1, a=3 and b=3; or wherein m=1, a=6 and b=0,

(ii) A compound (2) represented by the formula:

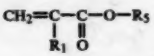


wherein R_1 is —H or —CH_3; R_2 is —H, an alkyl group having 1 to 5 carbon atoms, or



R_3 is a hydrocarbon group having 6 to 16 carbon atoms; and R_4 is a hydrocarbon group having 2 to 100 carbon atoms,

(iii) a compound (3) of the formula:



wherein R_1 is as defined above; and R_5 is a hydrocarbon group having 6 to 16 carbon atoms, and

(iv) a photopolymerization initiator in an amount of 0.5 to 5 parts by weight per 100 parts by weight of the total of the compounds (1), (2) and (3) and

the compounds (1), (2) and (3) being used in amounts falling in the area defined by the lines A-B-C-D-E-A in the triangular diagram of FIG. 1, wherein individual points A, B, C, D and E have the following values in percent by weight:

	Compound (1)	Compound (2)	Compound (3)
A	50	45	5
B	5	90	5
C	5	45	50
D	30	20	50
E	50	20	30

4,812,347

METHOD FOR MANUFACTURING A TAPE OF PHOTOGRAPHIC SLIDES

Petrus J. L. C. van Ulden, Ganzstraat 8, 6678 BA Oosterhout, Netherlands

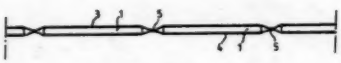
PCT No. PCT/NL84/00028, § 371 Date Apr. 12, 1985, § 102(e) Date Apr. 12, 1985, PCT Pub. No. WO85/01125, PCT Pub. Date Mar. 14, 1985

Continuation of Ser. No. 724,586, Apr. 12, 1985, abandoned. This PCT application Aug. 24, 1984, Ser. No. 70,161

Claims priority, application Netherlands, Aug. 26, 1984, 8302982

Int. Cl.[4] B05D *5/12*; E06B *9/26*

U.S. Cl. 428—77 **3 Claims**



1. A method of manufacturing a tape of spaced, framed, photographic slides to be used in a photographic printing machine, comprising the steps of

(1) fixedly but removably adhesively fastening each slide frame to two first strips of continuous tape along two parallel side-legs of the frame, each of said first strips having adhesive over their entire length on the side facing the slide frame;

(2) placing two second strips of continuous tape on the opposite side of said slide from each of said two first strips of tape, whereby each of said second strips is aligned with one of the two first strips; and

(3) contacting said second strips with the adhesive covered first tape at the intervals between adjacent slides along each of the two side-legs so as to fasten each first and second tape strips together at the intervals.

4,812,348

TORSION-STRESSED COMPONENT PART OF SUPERPOSED FIBER LAYERS

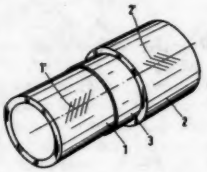
Thomas Rau, Liebenau, Fed. Rep. of Germany, assignor to Volkswagen AG, Fed. Rep. of Germany

Filed Jun. 2, 1987, Ser. No. 57,282

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1986, 3619602

Int. Cl.[4] F16L *9/14*; B32B *5/12*

U.S. Cl. 428—113 **6 Claims**



1. A torsion-stressed component part comprising a plurality of superposed rigid fiber-containing layers with fibers oriented in different directions, respectively, and an intermediate layer composed of a material which is soft relative to the fiber layers arranged between at least two superposed fiber-containing layers to join them in force-transmitting relation.

4,812,349

SHEET OF ROOFCOVERING MATERIAL

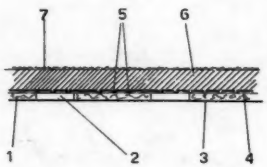
Martin Muelbeck, 5522 Pfaffstaedt 10, Austria

Filed Jun. 3, 1987, Ser. No. 56,844

Claims priority, application Netherlands, Jun. 25, 1986, 8601657

Int. Cl.[4] B32B *3/24, 11/10*; D06N *5/00*; E04D *5/12*

U.S. Cl. 428—138 **11 Claims**



1. Sheet of roofcovering material containing a porous base-layer having apertures distributed over its surface, and a bituminous covering layer over said base-layer wherein inserted between said porous base-layer and bituminous covering layer and over said base-layer is a perforated plastic film, the bituminous covering layer being adhered to said porous base-layer through the perforations of the perforated plastic film, whereby exceeding a certain shear stress between said base layer and said covering layer, the bituminous bond of the base layer with the covering layer present on the spots of the perforations is torn loose, during which said base layer and said covering layer shift with respect to each other.

4,812,350

ADHESION ENHANCER FOR COVERED POLYURETHANE PANELS

James E. Shrewsburg, Southgate, and Edward W. Cole, III, Wyandotte, both of Mich., assignors to BASF Corporation, Parsippany, N.J.

Continuation-in-part of Ser. No. 12,294, Feb. 9, 1987, abandoned. This application Nov. 19, 1987, Ser. No. 122,772

Int. Cl.[4] B32B *3/26*

U.S. Cl. 428—151 9 Claims

7. A molded elastomer shoe sole and leather upper comprising the product of

(a) a polyoxyalkylene polyether polyol mixture, wherein said polyol mixture comprises an effective amount of an adhesion enhancer,

(b) an organic polyisocyanate,

(c) a catalyst,

(d) a blowing agent, and

(e) a leather upper,

wherein the adhesion enhancer comprises a polyester polyol of adipic acid, ethylene glycol and butanediol and an ethylene oxide propylene oxide heteric polyol having a functionality from about 2 to about 3.

4,812,351

MAGNETIC RECORDING MEDIUM

Tsutomu Okita; Masashi Aonuma, and Hiroshi Hashimoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 71,595, Jul. 9, 1987, abandoned, which is a continuation of Ser. No. 802,234, Nov. 27, 1985, abandoned. This application May 3, 1988, Ser. No. 191,804

Int. Cl.[4] G11B *5/70*

U.S. Cl. 428—141 12 Claims

1. A magnetic recording medium comprising a non-magnetic support with opposing surfaces carrying a magnetic layer and backing layer both having a surface roughness of 0.02 μm or less, the magneti layer on one surface of the support, and the backing layer being on the surface of the support opposite to the surface on which the magnetic layer is formed, wherein the backing layer is formed by exposing to radiation a layer comprising (A) non-magnetic particles having an average particle size of 0.8 μm or less and (B) a binder comprising a radiation exposed radiation polymerizable compound wherein the weight ratio of non-magnetic particles to the binder is from 4/1 to 0.01/1 and wherein the radiaton polymerizable compound is used in an amount of 20 wt % or more based on the total weight of the binder wherein said magnetic layer is coated on the non-magnetic support and, dried, and then subjected to surface smoothin by calendering, whereafter the backing layer is coated and then the resulting assembly is subjected to said exposing the radiation to thereby obtain said magnetic recording medium.

4,812,352

ARTICLE HAVING SURFACE LAYER OF UNIFORMLY ORIENTED, CRYSTALLINE, ORGANIC MICROSTRUCTURES

Mark K. Debe, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 25, 1986, Ser. No. 899,653

Int. Cl.[4] B32B *5/00*

U.S. Cl. 428—142 27 Claims

1. An article comprising a substrate bearing on at least one major surface thereof a microlayer comprising an array of discrete, uniformly oriented, crystalline, solid microstructures, said microstructures comprising an organic compound

wherein the molecule thereof is planar and comprises chains or rings over which π-electron density is extensively delocalized.

4,812,353

PROCESS FOR THE PRODUCTION OF CIRCUIT BOARD AND THE LIKE

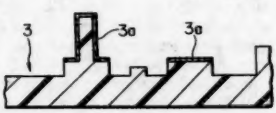
Tetsuo Yumoto, Tokorozawa, Japan, assignor to Sankyo Kasei Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1987, Ser. No. 109,357

Claims priority, application Japan, Dec. 27, 1986, 61-309079; Jan. 20, 1987, 62-8992

Int. Cl.[4] B05C *3/107*

U.S. Cl. 428—172 20 Claims



1. A process for producing a molded article comprising the steps of molding within a first mold a primary article having a surface with protrusions, roughening said surface and said protrusions of said primary molded article, treating said roughened surface and said roughened protrusions of said primary article with a catalyst, disposing said primary article with its roughened and catalytically treated surfaces and protrusions within a second mold, molding within said second mold a secondary molded article about said first primary molded article such that at least some outer surface sections of said protrusions are exposed, plating said exposed outer surface sections with metal, and stripping said secondary molded article from said primary molded article.

4,812,354

COLOR IMAGE RECORDING MATERIAL

Takeo Sugiyama, Takasago, and Shigetoshi Hiraishi, Tokyo, both of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed May 12, 1987, Ser. No. 48,943

Claims priority, application Japan, May 14, 1986, 61-110309; May 23, 1986, 61-119929

Int. Cl.[4] B41M *5/26*

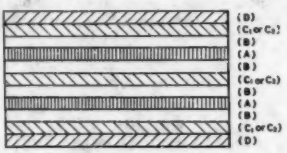
U.S. Cl. 428—195 13 Claims

1. An image recording material comprising a support and a hot-melt ink composition prepared by mixing at least one coloring material selected from yellow, magenta, cyan and black dyes and pigments, a wax, a photosetting resin and a polymerization initiator and said composition being applied to one side of the support.

4,812,355
FINISH LAMINATES FOR HIGH FREQUENCY CIRCUITS

Shigeki Yokoyama, Yokohama; Takeshi Kamiya, Kamakura; Takeo Niikawa, Yokohama; Masakatsu Nagase, Yamato, and Tetujiro Kuroishi, Sodegaura, all of Japan, assignors to Nippon Petrochemicals Co., Ltd., Chiyoda and Chukoh Chemical Industries, Ltd., Tokyo, both of, Japan

Filed Mar. 22, 1988, Ser. No. 171,910
Claims priority, application Japan, Mar. 26, 1987, 62-70303; Mar. 26, 1987, 62-70304; Mar. 26, 1987, 62-70305
Int. Cl.[4] B32B *7/02, 15/08, 17/10*
U.S. Cl. 428—215 18 Claims



1. A finish laminate for high-frequency circuits, which consists of a metal foil-covered multilayer structure composed of (I) at least one fundamental laminate in which a glass cloth layer (C) is laminated on at least one side of an ultrahigh molecular-weight polyethylene layer (A) with an adhesive layer (B) interposed therebetween, the layer (B) being made of at least one member selected from the group consisting of unsaturated carboxylic compound-modified polyolefins and epoxy group-containing olefinic polymers, one fundamental laminate being able to be laminated with another by interposing therebetween an adhesive layer (B), and (II) a metal foil (D) laminated on at least one outermost layer of the multilayer structure with an adhesive layer (B) interposed between said metal foil and outermost layer.

2. A finish laminate according to claim 1, wherein the layers (A), (B), (C) and (D) have thicknesses of 30–1000 μm, 10–100 μm, 30–100 μm and 5–70 μm, respectively.

4,812,356
COATING COMPOSITION FOR FLEXIBLE SUBSTRATES AND THE USE THEREOF, AND A METHOD FOR THE PRODUCTION OF A PROTECTIVE COATING

Rainer-Leo Meyer, Sommerbergstrasse 28, D-7580 Bühl/Baden; Reinmar John, Achern; Rolf Nagel, Baden-Baden, and Günter Müller, Obersasbach, all of Fed. Rep. of Germany, assignors to BGB-Gesellschaft Reinmar John; Rainer-Leo Meyer and Meyer geb. Klöffer, all of Bühl, Fed. Rep. of Germany

PCT No. PCT/EP85/00210, § 371 Date Mar. 11, 1987, § 102(e) Date Mar. 11, 1987, PCT Pub. No. WO86/06737, PCT Pub. Date Nov. 20, 1986
PCT Filed May 8, 1985, Ser. No. 3,404
Int. Cl.[4] B05D *3/02;* B32B *27/40, 9/00;* C08L *75/04*
U.S. Cl. 428—220 19 Claims

1. A moisture hardening one-component coating composition for flexible substrates, containing
35–60 wt.-% of a mixture consisting of hexamethylene diisocyanate prepolymer and toluylene diisocyanate prepolymer in a ratio of from 54 to 68 parts by weight of the former to 32 to 46 percent by weight of the latter,
8–15 wt.-% plasticizer,
0.3–2 wt.-% anti-settling agent,
2–10 wt.-% flaky extender,
5–25 wt.-% colorant pigment,
1–3 wt.-% moisture binding agent, and
10–20 wt.-% aliphatic ester.

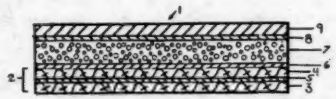
12. A method of providing a colored, highly elastic protective coating on a flexible substrate, comprising the steps of:
applying to the substrate a moisture-hardening one-component coating composition containing:
35–60 wt.-% of a mixture consisting of hexamethylene diisocyanate prepolymer and toluylene diisocyanate prepolymer in a ratio of from 54 to 68 parts by weight of the former to 32 to 46 percent by weight of the latter,
8–15 wt.-% plasticizer,
0.3–2 wt.-% anti-settling agent,
2–10 wt.-% flaky extender,
5–25 wt.-% colorant pigment,
1–3 wt.-% moisture binding agent, and
10–20 wt.-% aliphatic ester,
and allowing the coating to cure by access to moisture in ambient atmosphere.

15. In combination:
a flexible substrate: and a coating on said substrate, said coating having a thickness of at least 50 micrometers, and containing
35–60 wt.-% of a mixture consisting of hexamethylene diisocyanate prepolymer and toluylene diisocyanate prepolymer in a ratio of from 54 to 68 parts by weight of the former to 32 to 46 percent by weight of the latter,
8–15 wt.-% plasticizer
0.3–2 wt.-% anti-settling agent,
2–10 wt.-% flaky extender,
5–25 wt.-% colorant pigment,
1–3 wt.-% moisture binding agent, and
10–20 wt.-% aliphatic ester.

4,812,357
PRINTING BLANKET

Dennis D. O'Rell, Boxborough, and Peter M. Holleran, Concord, both of Mass., assignors to W. R. Grace & Co.-Conn., Lexington, Mass.

Filed Sep. 23, 1988, Ser. No. 248,460
Int. Cl.[4] B41N *9/00;* B32B *3/26, 7/02, 7/04*
U.S. Cl. 428—246 13 Claims



1. A resilient compressible printing blanket comprising:
(a) a base layer formed of a low machine direction, elongation stabilizing material;
(b) a compressible layer over the base layer, the compressible layer being comprised of foamed rubber;
(c) a stabilizing layer formed of a thermoplastic reinforced elastomer bonded to an upper surface of the compressible layer; and,
(d) a printing surface layer formed on top of the stabilizing layer.

5. The printing blanket of claim 1 wherein the thermoplastic component of the stabilizing layer is in a form selected from the group consisting of fibers, fibrils, microfibrils and mixtures thereof.

4,812,358
MAGNETIC RECORDING MEDIUM

Teru Miyake, and Yasushi Nakano, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Japan

Filed Aug. 21, 1987, Ser. No. 88,066
Claims priority, application Japan, Aug. 25, 1986, 61-199678
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—323 11 Claims

1. A magnetic recording medium comprising a magnetic layer, said magnetic layer comprising
a magnetic powdery material,
a first carbon black having a specific surface in terms of a

BET value of from 80 m^2/g to 900 m^2/g and an oil absorption in terms of DBP value of not less than 110ml/200 g, said first carbon black being present in a quantity of 0.1 to 10 parts by weight per 100 parts by weight of said magnetic powdery material, and

a second carbon black having a specific surface in terms of BET value of not less than 50 m^2/g and an oil absorption in terms of DBP value of less than 110 ml/100 g, said second carbon black being present in a quantity of 3 to 15 parts by weight per 100 parts by weight of said magnetic powdery material.

4,812,359

IMPACT-RESISTANT LAMINATE

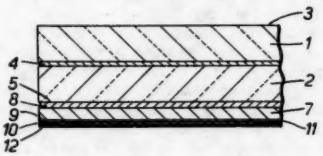
Christopher W. G. Hall, Redditch, United Kingdom, assignor to Pilkington Brothers P.L.C., Merseyside, England

Continuation-in-part of Ser. No. 718,432, Apr. 1, 1985, abandoned. This application May 23, 1986, Ser. No. 866,353

Claims priority, application United Kingdom, Apr. 4, 1984, 8408665; Jan. 8, 1985, 8500470

Int. Cl.[4] B32B *17/10, 27/36*

U.S. Cl. 428—332 **18 Claims**



1. An impact-resistant laminate comprising a front glass sheet which receives an impact and a rear polycarbonate sheet to the rear face of which there is adhered a thin polycarbonate sheet not more than about 0.64 mm thick having an abrasion-resistant self-healing coating of polyurethane.

4,812,360

THERMAL TRANSFER (PRINTING) MATERIAL

Shigeo Utsumi, Yokohama, Japan, assignor to Diafoil Company, Limited, Tokyo, Japan

Continuation of Ser. No. 929,275, Nov. 12, 1986, abandoned. This application Jul. 7, 1988, Ser. No. 218,481

Claims priority, application Japan, Nov. 12, 1985, 60-253413

Int. Cl.[4] B41M *5/20*

U.S. Cl. 428—337 **2 Claims**

1. A thermal transfer printing material comprising a film consisting of a biaxially oriented polyethylene 2,6-naphthalate film of Young's modulus in longitudinal direction of not less than 700 kg/mm^2 and Young's modulus in transverse direction of not less than 600 kg/mm^2 as the base material, and a thermal transfer layer coated on one of the surfaces of said film.

4,812,361

ACRYLIC FIBER HAVING Y-TYPE SECTION AND PROCESS FOR PRODUCING THE SAME

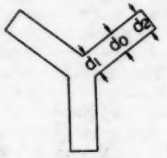
Fumio Takemoto; Tuneo Kunishige, and Mitsutoshi Ochi, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 796,071, Nov. 8, 1985, abandoned. This application Nov. 20, 1985, Ser. No. 800,158

Claims priority, application Japan, Nov. 21, 1984, 59-246722

Int. Cl.[4] D02G *3/00*

U.S. Cl. 428—397 **1 Claim**



1. Acrylic fibers each having a splittable Y-type cross-section which consist of an acrylic polymer constituted of at least 50% by weight of acrylonitrile, characterized in that the Y-type cross section is constructed substantially of three rectangles and when the thickness values of the middle part, innermost part, and outermost part of each component rectangle are represented by d_0, d_1, and d_2, respectively, the ratios of d_1/d_0 and d_2/d_0 are each in the range of 0.95 to 1.05 and the longer to shorter side length ratio of at least one of the three branch rectangles constructing the Y-type cross section is at least 3:1 and not more than 7:1.

4,812,362

SOLID PHASE N-HYDROXYSUCCINIMIDE REAGENTS

Mark L. Stolowitz, Long Beach, Calif., assignor to Bio-Affinity Systems, Inc., Torrance, Calif.

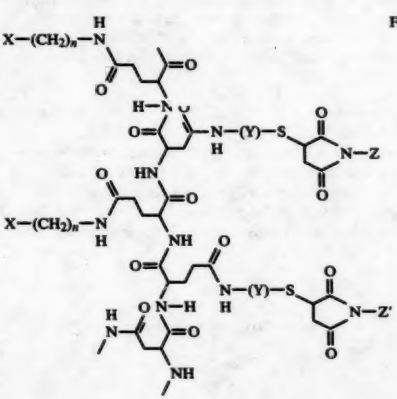
Filed Aug. 10, 1987, Ser. No. 84,325

Int. Cl.[4] B32B *5/16*

U.S. Cl. 428—407 **15 Claims**

1. A solid phase N-hydroxysuccinimide reagent having the general formula I:

Formula I



wherein X is particulate silica gel or controlled pore glass; n is 3 to 7; Y is selected from $(CH_2)_{n'}$ and $(CH_2)_{n'}$—N—H—CO—CH_2, wherein n' is 2 to 6; Z is selected from OH, OCOR, OSO_2R and OCO_2R, Z' is selected from OH and Z,

and wherein R is selected from a chromophore, fluorophore and electrophore.

4,812,363

POLYMERIC COUPLING AGENT

James P. Bell, 34 Farmstead Rd., Storrs, Conn. 06268, and Randall G. Schmidt, 1500 Illinois Dr., Midland, Mich. 48640

Filed Oct. 26, 1987, Ser. No. 113,825
Int. Cl.[4] B32B 7/04
U.S. Cl. 428—420 **22 Claims**

1. A method of improving the adhesion between a metal substrate and a thermoset resin comprising the steps of:

providing a layer of a polymeric coupling agent onto the surface of a metal substrate, the polymeric coupling agent comprising a hydrophobic polymeric backbone having a plurality of functional groups attached thereto at spaced intervals along said hydrophobic polymeric backbone, said functional groups forming chemical bonds with said metal substrate and said thermoset resin;

providing a thermoset polymeric resin onto said layer of polymeric coupling agent; and

curing said polymeric coupling agent and thermoset resin to chemically bond said coupling agent to said metal substrate and said thermoset resin.

13. An article of construction comprising:

a metal substrate;

a layer of a polymeric coupling agent on a surface of said metal substrate, said polymeric coupling agent comprising a hydrophobic polymeric backbone having a plurality of functional groups attached thereto at spaced intervals along said hudrophobic polymeric backbone, said functional groups forming chemical bonds with said metal substrate and a thermoset polymeric resin; and

a thermoset polymeric resin on said layer of polymeric coupling agent wherein said polymeric coupling agent chemically bonds said thermoset resin to said metal substrate.

4,812,364

POLYETHER SILOXANE GRAFT POLYMERS

Heinrich Alberts, Odenthal, and Hans-Bernd Alteweier, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

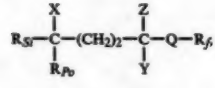
Filed Dec. 8, 1987, Ser. No. 130,055
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1986, 3643459
Int. Cl.[4] B32B 9/04
U.S. Cl. 428—447 **10 Claims**

1. A graft comprising

(a) 0.1 to 99.9% by weight of polyalkylene oxide-organopolysiloxane block and/or comb polymer units and

(b) 99.9 to 0.1 % by weight of units of a polymerized perfluoroalkyl substituted allyl compound,

which graft polymer contains structural elements of the formula

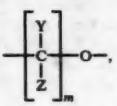


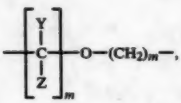
wherein

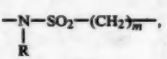
X denotes a hydrogen atom or a methyl group,

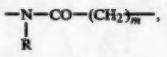
Y and Z denote, independently of one another, a hydrogen atom or an alkyl group containing 1 to 18 carbon atoms,

Q denotes a divalent alkylene group containing 1 to 12 carbon atoms, a divalent group of the formula









or a group of the formula

wherein

R denotes a hydrogen atom or an alkyl group containing 1 to 18 carbon atoms, and

m denotes an integer from 0 to 6,

R_f denotes a perfluorinated aliphatic group containing 1 to 20 carbon atoms, which group may contain at the most one hydrogen or one chlorine atom on two carbon atoms in addition to the fluorine atoms, or a perfluoroalkyl polyether group,

R_{SI} denotes the radical of a polyalkylene oxide-organopolysiloxane block and/or comb polymer,

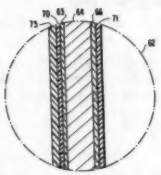
R_{Po} denotes a polyalkylene oxide chain of the polyalkylene oxide-organopolysiloxane black and/or comb polymer, in the graft polymers more than 50 % by weight of perfluoroalkyl-substituted allyl monomers being fixed as monomolecular units to the alkylene oxide units of the polyalkylene oxide-organpolysiloxane block and/or comb polymers.

4,812,365

COMPOSITE-COATED FLAT-ROLLED STEEL CAN STOCK AND CAN PRODUCT

William T. Saunders, and Warren D. Livingston, Both of Weirton, W. Va., assignors to Weirton Steel Corporation, Weirton, W. Va.

Filed Apr. 25, 1986, Ser. No. 855,694
Int. Cl.[4] B32B 9/00; B65D 25/00; B05D 1/36; C23C 22/24
U.S. Cl. 428—469 **9 Claims**



1. Process for producing compositecoated flat-rolled steel can stock for can end closures or fabrication of cup-shaped one-piece drawn work product comprising

providing continuous-strip steel substrate,
cleaning both surfaces of such substrate,
chemically treating such substrate to apply a coating consisting essentially of chrome oxide to both surfaces thereof, then
applying an organic base coating to both such chemically treated surfaces of the substrate,
such base coating consisting of a preselected organic heat-curable coating material applied with a coating weight between about 2.5 to about 5 milligrams per square inch of each surface.
curing such organic base coating,
applying an additional heat-curable organic coating to at least one surface of such base coated substrate to provide a total organic coating weight on such at least one surface of between 7.5 and 15 milligrams/in^2,
such additional organic coating being selected to be compatible with such organic base coating and being applied to such at least one surface of the substrate which is to be used for the interior of a can product formed from such can stock, and
curing such additional organic coating on such at least one surface.

4,812,366

VISCOSITY ADJUSTMENT OF AMMONIATED UREA-FORMALDEHYDE RESIN COMPOSITIONS BY ADDITION OF DRIED UREA-FORMALDEHYDE POWDER

Thomas F. Duncan, Louisville, Ky., and Regis F. Kline, New Albany, Ind., assignors to Borden Inc., Columbus, Ohio

Filed Jan. 25, 1988, Ser. No. 148,303
Int. Cl.[4] C08L *61/32*
U.S. Cl. 428—528 **22 Claims**

1. A composition of matter comprising an aqueous solution or suspension of an ammoniated urea-formaldehyde resin wherein said ammoniated urea-formaldehyde resin is prepared by reacting ammonia and a urea-formaldehyde resin or by reacting ammonia and formaldehyde, followed by the addition of urea and wherein said ammoniated urea-formaldehyde resin has a formaldehyde:urea mole ratio of from 2.6:1 to 1.7:1, to which solution or suspension has been added an amount of water soluble dried urea-formaldehyde resin powder, wherein said water soluble dried urea-formaldehyde resin powder is prepared by drying an aqueous solution or suspension of a water soluble urea-formaldehyde resin with a formaldehyde:urea mole ratio of 1.6:1 to 1.3:1, wherein the ratio of ammoniated urea-formaldehyde resin solids to dried urea-formaldehyde resin powder solids is from approximately 20:1 to 2:1 by weight, and wherein the total resin solids level in the composition is in the range of from approximately 65 to 75 percent by weight, and wherein the free formaldehyde content of the composition is less than about 1% by weight.

7. A process for adhering paper to a lignocellulosic substrate comprising:

(a) applying a coating of the composition of claim 1 to a lignocellulosic substrate or to a paper, or both; and

(b) applying to the coated lignocellulosic substrate or to the coated paper, or both, a catalyst in an amount sufficient to reduce the pH of the composition to thereby accelerate the cure of the composition; and

(c) contacting the paper with the lignocellulosic substrate; whereby the paper adheres to the substrate to produce a laminate.

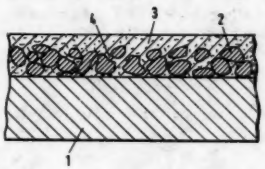
15. An article produced according to the process of claim 7.

4,812,367

MATERIAL FOR LOW-MAINTENANCE SLIDING SURFACE BEARINGS

Wolfgang Bickle, Reilingen, Fed. Rep. of Germany, assignor to Kolbenschmidt Aktiengesellschaft, Neckarsulm, Fed. Rep. of Germany

Filed Sep. 22, 1986, Ser. No. 909,997
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1985, 3534133
Int. Cl.[4] B32B *00/00*
U.S. Cl. 428—332 **3 Claims**



1. A material for low-maintenance sliding surface bearings, which material comprises a metallic backing and a bearing layer having a thickness of 30 to 500 μm and consisting of a mixture of polyvinylidene fluoride (PVDF) and at least one additive for improving the friction and sliding properties, wherein the mixture further contains 1 to 2% by weight of a non-toxic metal oxide powder consisting of one of chromic oxide and ferrix ocide having a particle size of about 0.05 μm, 10 to 40% by weight of solid glass spheres having a size of 1 to 50 μm and coated with a coupling agent comprising silane and 5 to 25% by weight polytetrafluoroethylene (PTFE) having a particle size of 6 μm and wherein the bearing layer is provided on a rough primer, on the backing and wherein the rough primer consists of one of a sintered and sprayed-on porous bronze layer having a thickness of 200 to 350 μm and the open pores of the bronze layer have a total volume of 24 to 45% and are completely filled by the mixture which consists of PVDF, metal oxide powder and glass spheres and which also constitute the bearing layer.

4,812,368

PROCESS FOR THE PREPARATION OF LIGHTWEIGHT, PLANAR MOLDED ARTICLES

Dietrich Scherzer, Nottingham, Great Britain; Erwin Zahn, Neustadt, and Wolfram Frank, Heidelberg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 23, 1987, Ser. No. 136,990
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1987, 3700245
Int. Cl.[4] B32B *5/18, 5/24;* C08J *7/16;* B29C *67/20*
U.S. Cl. 428—332 **18 Claims**

1. A process for the preparation of lightweight, planar molded articles by treating porous materials with an effective amount of an organic compound containing NCO groups and allowing the isocyanate compound to cure, optionally while molding, wherein the organic compound containing the NCO groups is used in the form of a non-flammable aqueous dispersion or emulsion.

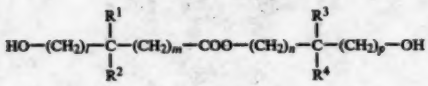
4,812,369

MAGNETIC RECORDING MEDIUM

Kazuko Hanai; Yasuyuki Yamada, and Takahito Miyoshi, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 17, 1986, Ser. No. 920,166
Claims priority, application Japan, Oct. 19, 1985, 60-232303
Int. Cl.[4] G11B 5/70
U.S. Cl. 428—425.9 5 Claims

1. A magnetic recording medium comprising a non-magnetic support and a magnetic recording layer provided on said support, said magnetic recording layer comprising a ferromagnetic powder dispersed in a binder, wherein said binder comprises a polyurethane resin which has a repeating unit derived from diol having the formula (I):



(I)

in which R^1, R^2, R^3 and R^4 are the same or different from each other, each of R^1, R^2, R^3 and R^4 is any one of a hydrogen atom, a saturated or unsaturated aliphatic group having 1–5 carbon atoms, an aromatic group and a cyclic aliphatic group, and at least three substitutients among R^1, R^2, R^3 and R^4 are not hydrogen atoms; and l, m, n and p are independently integers of 1–3, 0–2, 1–3 and 1–3, and 1–3, respectively, wherein the amount of the repeating unit having the formula (I) among the diol repeating units which composes the polyurethane resin is not less than 20 mol.%, said polyurethane resin being prepared from a polyester having a number average molecular weight of 500 to 8,000 by reacting a diol containing not less than 20 mol.% of the diol compound of the formula (I) with a dicarboxylic acid which is further reacted with a polyisocyanate).

4,812,370

SURFACE COATED TUNGSTEN CARBIDE-BASE SINTERED HARD ALLOY MATERIAL FOR INSERTS OF CUTTING TOOLS

Yoshikazu Okada; Jun Sugawara, and Sumiyoshi Takizawa, all of Tokyo, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1987, Ser. No. 101,208
Claims priority, application Japan, Oct. 3, 1986, 61-235726
Int. Cl.[4] B22F 7/04
U.S. Cl. 428—552 9 Claims

1. A surface coated tungsten carbide-base sintered hard alloy material for an insert of a cutting tool, comprising:

(1) a substrate formed of a tungsten carbide base sintered hard alloy having an internal portion consisting essentially of:

5–30 percent by weight of one composite metal carbo-nitride, as a compound forming a hard disperse phase, selected from the group consisting of (Ti, W)CN, (Ti, Nb, W)CN, (Ti, Ta, W)CN, and (Ti, Nb, Ta, W)CN;

4–10 percent Co as a component forming a binder phase, and the balance of WC as a component forming said hard disperse phase and inevitable impurities;

said substrate having a surface portion formed with a Co-enriched layer being substantially free of said composite metal carbo-nitride; and

(2) a hard surface layer coated over the surface of said substrate, comprising:

an innermost layer consisting essentially of TiC, said innermost layer containing one of a W component and W and Co components diffused from said substrate;

a diffusion preventing layer formed by one of a single layer of one compound selected from the group consisting of TiCN and TiN or a double layer of both of said compounds TiCN and TiN, said diffusion preventing layer preventing diffusion of one of said W component and said W and Co components;

an inner layer consisting essentially of TiC; and

an outer layer formed by one of a single layer of one compound selected from the group consisting of TiCO, TiCNO, and Al_2O_3 and a double layer of two compounds selected from same;

said innermost layer, said diffusion preventing layer, said inner layer, and said outer layer being superposed one upon another in the order mentioned.

4,812,371

ZN-AL HOT-DIP GALVANIZED STEEL SHEET HAVING IMPROVED RESISTANCE AGAINST SECULAR PEELING OF COATING

Yoshio Shindou, and Motoo Kabeya, both of Kimitsu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Division of Ser. No. 931,636, Nov. 17, 1986. This application Aug. 4, 1987, Ser. No. 81,664
Int. Cl.[4] B32B 15/18
U.S. Cl. 428—659 4 Claims

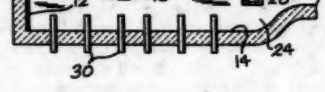
1. A Zn-Al hot-dip galvanized steel sheet having improved corrosion-resistance and resistance against secular peeling, and having a hot-dip galvanized coating on a low carbon steel sheet using a galvanizing bath which contains from 0.15 to 10% Al, from 0.2 to 1% of Sb, from 0.01 to 2% of Si, and balance being Zn and unavoidable impurities such as Pb, Sn, and Cd in an amount less than 0.02%, and additionally contains from 0.01 to 1% of at least one member selected from the group consisting of Mg and mischmetal.

4,812,372

REFRACTORY METAL SUBSTRATE AND COATINGS THEREFOR

Subhash S. Kithany, Reynoldsburg, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 25, 1988, Ser. No. 147,963
Int. Cl.[4] B32B 15/01; C03B 5/42
U.S. Cl. 428—664 4 Claims



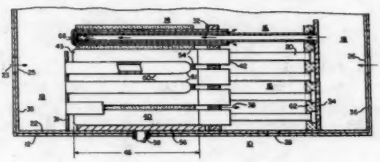
1. A coated refractory metal substrate suitable for use in contact with an oxygen- or nitrogen-containing environment at a temperature greater than the oxidation or nitridation acceleration temperature of the substrate, comprising a refractory metal substrate comprising, by weight percent: from about 10 to about 20 chromium, from about 0 to about 5 alumina (Al_2O_3), from about 0 to about 1 yttria (Y_2O_3), from about 0 to about 0.5 titanium, from about 0 to about 0.1 zirconium, the balance being essentially molybdenum to make 100% of the refractory metal substrate, and having a coating comprised of chromium metal, wherein the chromium metal coating has a thickness within the range of from about 0.5 mil. to about 25 mil.

4,812,373

FUEL FEED ARRANGEMENT FOR A FUEL CELL GENERATOR

Ralph E. Grimble, Finleyville, and Edward V. Somers, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 16, 1986, Ser. No. 852,865
Int. Cl.[4] H01M 8/18
U.S. Cl. 429—19 10 Claims



1. A fuel cell generator comprising a generating chamber containing a plurality of fuel cells and fuel feed conduits, surrounded by a housing, where each fuel cell comprises an inner oxidant electrode and an exterior fuel electrode, with solid oxide electrolyte between the inner and exterior electrodes, the fuel feed conduits are exterior to and disposed between the fuel cells to distribute unreformed fuel feed to the exterior electrode surfaces of the fuel cells, and essentially the total linear length of the exterior electrode surfaces of the fuel cells within the generating chamber are electrochemically active and effective to reform fuel feed.

4,812,374

ANODE ACTIVE MATERIAL AND ALKALINE CELLS CONTAINING SAME, AND METHOD FOR THE PRODUCTION THEREOF

Keiichi Kagawa, Takehara, and Kiyoshi Taniyasu, Hiroshima, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1983, Ser. No. 479,509
Claims priority, application Japan, Apr. 19, 1982, 57-63930; Jun. 23, 1982, 57-106686
Int. Cl.[4] H01M 4/42
U.S. Cl. 429—50 7 Claims

1. An anode active material composed of, by weight of the metals, of zinc powder or a zinc—0.005 to 1% lead alloy powder anfd 0.01 to 1.8% of indium or thallium, the metals being amalgamated to an extent that the mercury content is 1%.

4,812,375

SEPARATOR FOR LITHIUM BATTERIES AND LITHIUM BATTERIES INCLUDING THE SEPARATOR

Donald L. Foster, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 27, 1988, Ser. No. 213,031
Int. Cl.[4] H01M 2/16
U.S. Cl. 429—101 21 Claims

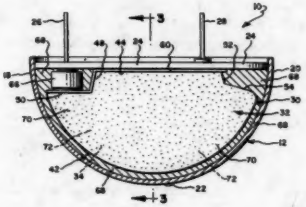
1. A multilayer separator for preventing the internal shorting of lithium batteries, said multilayer separator including porous membranes and an electroactive polymeric material contained within the separator layers wherein the polymer is one that will react with any lithium dendrites that could penetrate the separator thus preventing an internal short circuit of the cell.

4,812,376

ANODE COATING FOR LITHIUM CELL

Frank W. Rudolph, Depew, N.Y., assignor to Wilson Greatbatch Ltd., Clarence, N.Y.

Filed Oct. 15, 1987, Ser. No. 108,453
Int. Cl.[4] H01M 6/18, 10/36
U.S. Cl. 429—101 47 Claims



26. In an alkali metal-oxyhalide electrochemical cell wherein an alkali metal anode has a surface in operative contact with a liquid cathode/electrolyte, the improvement comprising:

a coating on said anode surface comprising a thin film of substrate material impregnated with organic material.

4,812,377

HIGH RESOLUTION POLYESTER DEVELOPERS FOR ELECTROSTATOGRAPHY

John C. Wilson, Rochester; Domenic Santilli, Webster, and Lawrence P. DeMejo, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 28, 1988, Ser. No. 173,901
Int. Cl.[4] G03G 9/08, 9/12
U.S. Cl. 430—109 16 Claims

1. An electrostatographic toner composition comprising an amorphous fusible polyester resin, said resin being a branched chain polyester containing 2,3-dihydro-1,3-dioxo-2-yl-1H isoindole-ar(-yl or -diyl) groups in sufficient concentration to make the polyester resin grindable to fine particle size.

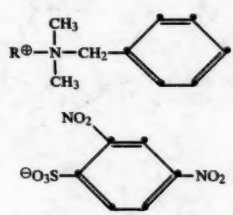
4,812,378

ELECTROSTATOGRAPHIC TONERS AND DEVELOPERS CONTAINING CHARGE-CONTROL AGENTS

Douglas E. Bugner; Peter S. Alexandrovich; Lawrence P. DeMejo; Robert A. Guistina, and James H. Anderson, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 17, 1987, Ser. No. 134,478
Int. Cl.[4] G03G 9/08
U.S. Cl. 430—110 4 Claims

1. A dry, particulate, electrostatographic toner composition comprising a polymeric binder and a charge-control agent comprising a quaternary ammonium salt having the structure



wherein R is alkyl having 12 to 18 carbon atoms.

4,812,379

ELECTROPHOTOGRAPHIC TONERS CONTAINING AN ADDITIVE REINFORCING THE CATIONIC CHARGE

Horst Harnisch, Much, and Roderich Raue, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

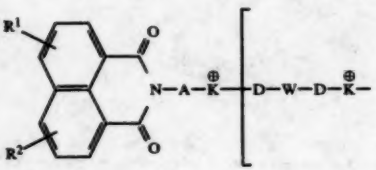
Filed Feb. 3, 1987, Ser. No. 10,364

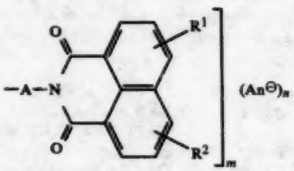
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1986, 3604827

Int. Cl.[4] G03G 9/16

U.S. Cl. 430—110 4 Claims

1. Electrophotographic toners comprising an additive reinforcing the cationic charge, of the formula





in which

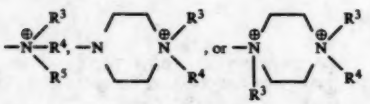
R^1 and R^2 each represent hydrogen, chlorine, bromine, hydroxyl, C_1–C_4-alkoxy or carboxyl,

A represents C_1–C_5-alkylene or $-C_6H_4-CH_2-$ (m or p),

m represents 0 or 1,

n represents 1 or 2

$K^{\oplus}$ represents



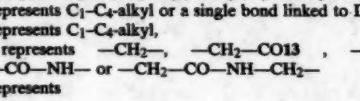
R^3 represents C_1–C_{18}-alkyl, carbamoyl-C_1–C_2-alkyl, C_1–C_4-alkoxycarbonyl-C_1–C_2-alkyl, benzyl, cyclohexyl or allyl,

R^4 represents C_1–C_4-alkyl or a single bond linked to D,

R^5 represents C_1–C_4-alkyl,

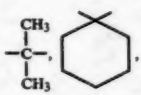
D represents $-CH_2-$, $-CH_2-CO13$, $-CH_2-CO-NH-$ or $-CH_2-CO-NH-CH_2-$

W represents



—CO— or a single bond,

Z represents $-CH_2-$,



—O—, —S—, $-SO_2-$ or a single bond and

$An^{\ominus}$ represents an anion, resin and pigment particles.

4,812,380

ELECTROSTATOGRAPHIC TONERS AND DEVELOPERS CONTAINING NEW CHARGE-CONTROL AGENTS

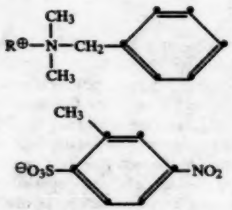
Douglas E. Bugner, and Peter S. Alexandrovich, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 17, 1987, Ser. No. 134,399

Int. Cl.[4] G03G 9/08

U.S. Cl. 430—110 4 Claims

1. A dry, particulate, electrostatographic toner composition comprising a polymeric binder and a charge-control agent comprising a quaternary ammonium salt having the structure



wherein R is alkyl having 12 to 18 carbon atoms.

4,812,381

ELECTROSTATOGRAPHIC TONERS AND DEVELOPERS CONTAINING NEW CHARGE-CONTROL AGENTS

Douglas E. Bugner; Peter S. Alexandrovich; Lawrence P. DeMejo, and Robert A. Guistina, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 17, 1987, Ser. No. 134,285

Int. Cl.[4] G03G 9/08

U.S. Cl. 430—110 4 Claims

1. A dry, particulate, electrostatohgraphic toner composition comprising a polymeric binder and a charge-control agent comprising a quaternary ammonium salt having the structure

wherein R is alkyl having 12 to 18 carbon atoms.

4,812,382

ELECTROSTATOGRAPHIC TONERS AND DEVELOPERS CONTAINING NEW CHARGE-CONTROL AGENTS

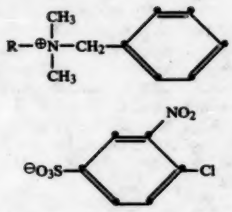
Douglas E. Bugner, and Peter S. Alexandrovich, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 17, 1987, Ser. No. 134,411

Int. Cl.[4] G03G 9/08

U.S. Cl. 430—110 4 Claims

1. A dry, particulate, electrostatographic toner composition comprising a polymeric binder and a charge-control agent comprising a quaternary ammonium salt having the structure



wherein R is alkyl having 12 to 18 carbon atoms.

4,812,383

PROCESS FOR FORMING ELECTROPHOTOGRAPHIC IMAGES ON A SELF-FUSING SUBSTRATE

D. Paul Foote, Sierra Madre, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 29, 1987, Ser. No. 115,010

Int. Cl.[4] G03G *13/16, 13/22*

U.S. Cl. 430—126 **28 Claims**

1. A process for forming permanent electrophotographic images comprising: (a) generating, in an electrophotographic imaging apparatus, an electrostatic latent image; (b) developing said image with a liquid developer composition comprising a colorant, a solvent and a polymeric material having adhesive properties when wetted with said solvent and exhibiting solubility in said solvent; (c) transferring said image to a substrate while said image is wet, said substrate having a coating comprising said polymeric material; and (d) permitting said image to dry on said substrate.

4,812,384

LIGHT-SENSITIVE POLYCONDENSATION PRODUCT CONTAINING DIAZONIUM GROUPS, PROCESS FOR THE PREPARATION THEREOF, AND LIGHT-SENSITIVE RECORDING MATERIAL CONTAINING THIS POLYCONDENSATION PRODUCT

Werner Franke, Wiesbaden, and Richard Brahm, Ingelheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 24, 1986, Ser. No. 934,026

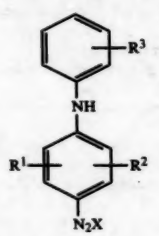
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1985, 3541723

Int. Cl.[4] G03C *1/54;* C07C *113/04*

U.S. Cl. 430—175 **3 Claims**

1. A light-sensitive polycondensation product which contains diazonium groups, comprising units of

(a) a diazonium salt represented by the formula



(I)

in which

R^1, R^2 and R^3 separately denote a hydrogen atom, a halogen atom, an alkyl group having 1 to 3 carbon atoms or an alkoxy group having 1 to 6 carbon atoms and

X denotes then anion of said diazonium salt, and

(b) A compund represented by the formula

$$R^4—O—CH_2—R^6—CH_2—O—R^5 \quad \text{(II)}$$

in which

R^4 and R^5 separately denote a hydrogen atom, an alkyl group or an aliphatic acyl radical and

R^6 denotes a radical of an aromatic hydrocarbon, a phenol, a phenol ether, aromatic thioether, an aromatic heterocyclic compound or an organic acid amide,

wherein the diazonium salt anion of said polycondensation product is the anion of an aminoalknesulfonic acid or an alkali metal salt thereof that is soluble in purely aqueous solution and is capable of forming, after irradiation, a water-insoluble product.

4,812,385

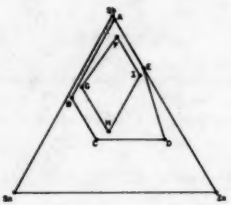
RECORDING ELEMENTS COMPRISING WRITE-ONCE THIN FILM ALLOY LAYERS

Kee-Chuan Pan; Yuan-Sheng Tyan, both of Webster, and Donald R. Preuss, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 58,722, Jun. 5, 1987, Pat. No. 4,774,170. This application May 23, 1988, Ser. No. 197,717

Int. Cl.[4] G03C *1/72;* G01D *15/34*

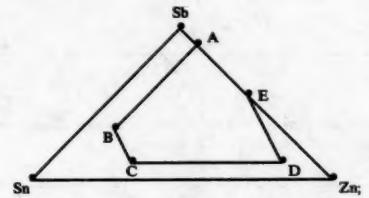
U.S. Cl. 430—290 **3 Claims**



1. A method of recording information, comprising the steps of:

(a) providing a recording element comprising a write-once amorphous thin-film optical recording layer of an alloy having a composition within a polygon in a ternary composition diagram of antimony, zinc, and tin; wherein

(i) the composition diagram is



and

(ii) the polygon has the following vertices and corresponding coordinates in atom percent:

Vertices	Coordinates			
	Sb	Sn	Zn	
A	98	0	2	
B	54	44	2	
C	30	44	26	
D	30	10	60	
E	70	0	30;	and

(b) focusing an information modulated laser beam on the recording layer to form a pattern of crystalline and amorphous areas in the layer.

4,812,386

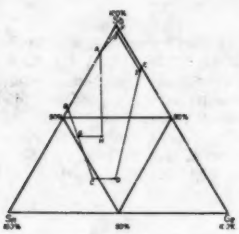
RECORDING ELEMENTS COMPRISING WRITE-ONCE THIN FILM ALLOY LAYERS

Kee-Chuan Pan; Yuan-Sheng Tyan, both of Webster, and Salvatore J. Marino, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 14,337, Feb. 13, 1987. This application May 23, 1988, Ser. No. 197,557

Int. Cl.[4] G03C *1/72*; G01D *15/34*

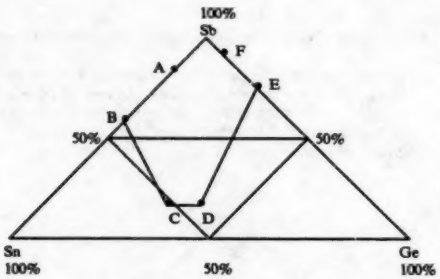
U.S. Cl. 430—290 4 Claims



1. A method of recording information, comprising the steps of:

(a) providing a recording element comprising a write-once amorphous thin-film optical recording layer of an alloy having a composition within a polygon in a ternary composition diagram of antimony, germanium and tin; wherein

(i) the composition diagram is



(ii) the polygon has the following vertices and corresponding coordinates in atom percent:

Vertices	Coordinates Sb	Sn	Ge	
A	86	13.99	0.01	
B	55	44.99	0.01	
C	18	52	30	
D	18	42	40	
E	78	0	22	
F	98	0	2	; and

(b) focusing an information modulated laser beam on the recording layer to form a pattern of crystalline and amorphous areas in the layer; wherein all the crystalline areas are in the same state with a higher reflectivity than the amorphous areas.

4,812,387

METHOD OF FORMING FUNCTIONAL FILMS ON FINE TRANSPARENT ELECTRIC CONDUCTIVE CIRCUIT PATTERN AND SPACES THEREOF

Tameyuki Suzuki, Zushi; Junichi Yasukawa, Chigasaki; Toyokazu Nomura, Narashino; Kazuo Toda, Tokyo; Takuro Kamakura, Matsudo, and Toshiaki Ota, Narashino, all of Japan, assignors to Shinto Paint Co., Ltd., Amagasaki, Japan

Filed Apr. 14, 1987, Ser. No. 38,125

Claims priority, application Japan, Apr. 21, 1986, 61-91938

Int. Cl.[4] G03C *5/00*; G02F *1/13*

U.S. Cl. 430—311 2 Claims

1. A method of forming a first functional film on an electroconductive circuit pattern on a transparent base board, said base board having said pattern on one surface thereof, and a second functional film covering the spaces about the pattern which comprises:

forming a thin light-shielding first functional film on the pattern and curing the film by high polymer electrode deposition coating, said film functioning as a color filter;

applying a photo-curable, light-shielding, second functional film to the surface of the transparent base board having the first functional film thereon;

exposing the surface of the transparent base board opposite to that having the functional films coated thereon to light and curing the portions of the photo-curable, second functional film covering the spaces about the pattern; and

removing the uncured portions of the second functional film over the light-shielding, first functional film.

4,812,388

PROCESS TO OBTAIN THIN FILM LINES

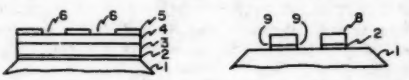
Giampiero Ferraris, Monza, and Antonio Tersalvi, Milan, both of Italy, assignors to GTE Telecomunicazioni, S.p.A., Cassina de Pecchi, Italy

Continuation of Ser. No. 846,772, Mar. 31, 1986, abandoned. This application Sep. 25, 1987, Ser. No. 102,302

Claims priority, application Italy, May 3, 1985, 20567 A/85

Int. Cl.[4] G03C *5/16*

U.S. Cl. 430—314 9 Claims



1. A process to obtain thin film lines on an insulating support by photolithography of thick resist and subsequent galvanic growth of metals, characterized in that:

said insulating support covered by a metalization layer;

said thick resist is obtained by a deposit of a first polyimide layer on said metalization layer followed by a first cycle of cure and a successive deposit of a second polyimide layer followed by a second cycle of cure, said first and second polyimide cured layers forming an homogeneous and uniform polyimide layer;

said polyimide layer covered by a metallic layer;

said metallic layer covered by a photosensitive lacquer layer;

said photosensitive lacquer layer exposed to ultraviolet light through a metallic mask;

said exposed photosensitive lacquer layer is developed to produce seats in said photosensitive lacquer layer;

said metallic layer is etched to produce seats in said metallic layer;

said polyimide layer etched by oxygen gas plasma for a first predetermined time interval;

said etching producing in said polyimide layer seats with essentially vertical walls;

a selective galvanic deposition of metal lines within said seats characterized by essentially vertical walls; and

said metallic layer is removed and said polyimide layer is

etched by oxygen gas plasma for a second predetermined time interval.

4,812,389

PROCESS FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING DIR COUPLER HAVING A GROUP FUNCTIONING AS A DEVELOPMENT INHIBITOR

Kei Sakanoue; Seiji Ichijima, and Shinzo Kishimoto, all of Minami Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 25, 1986, Ser. No. 911,619

Claims priority, application Japan, Sep. 25, 1985, 60-211498; Dec. 9, 1985, 60-276620

Int. Cl.[4] G03C *1/46, 5/24, 5/44*

U.S. Cl. 430—382 16 Claims

1. A process for processing a DIR coupler-containing silver halide color photographic material for photographing use in a continuous manner with replenishment of a developing solution, in which said DIR coupler is a coupler which has in a coupling active site a group that functions as a development inhibitor or a development inhibitor precursor upon being eliminated from the coupling active site by color development processing and that will be decomposed to a compound exerting substantially no influences on photographic properties after flowing into a color developing solution, said development inhibitor having a half-value period of 4 hours or shorter at a pH of 10.0, and in which process the developing solution is replenished in an amount of 700 ml or less per m^2 of light-sensitive material developed; wherein the DIR coupler is represented by the following general formula (I'):

$$A[(L_1)_a—Z—(L_2—Y)_b—]_m \quad (I')$$

wherein:

A represents a coupler component;

Z represents a fundamental portion of a compound which shows development-inhibiting action, and is bound to the coupling site of a coupler directly (a=0) or through a linking group, L_1 (a=1);

Y represents a substituent bond to Z through a linking group L_2 to allow the development-inhibiting effect of Z to emerge, with the linking group represented by L_2 containing a chemical bond to be cleaved in a developer;

a represents 0 or 1, and b represents 1 or 2, provided that when b represents 2, two ($—L_2Y$)s may be the same or different; and

m represents 1 or 2.

4,812,390

PROCESS AND ELEMENT FOR OBTAINING A PHOTOGRAPHIC IMAGE

Pier G. Giannesi, Livorno, Italy, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 30, 1987, Ser. No. 115,760

Claims priority, application Italy, Nov. 13, 1986, 22323 A/86

Int. Cl.[4] G03C *1/02, 5/24*

U.S. Cl. 430—434 16 Claims

1. A process for obtaining a photographic image upon exposure and development of a silver halide emulsion characterized by exposing light insensitive optically sensitized grains and then developing light sensitive optically unsensitized silver halide grains reactively associated with such light insensitive grains during exposure and development.

4,812,391

SILVER HALIDE PHOTOGRAPHIC MATERIAL CONTAINING POLYMER FIXATION ACCELERATOR

Ichizo Toya, and Tomokazu Yasuda, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 19, 1987, Ser. No. 109,888

Claims priority, application Japan, Oct. 17, 1986, 61-247111

Int. Cl.[4] G03C *5/38, 1/46, 7/26, 1/06*

U.S. Cl. 430—564 10 Claims

1. A silver halide photographic material comprising a support and at least one photosensitive silver halide emulsion layer containing photosensitive silver halide grains, said silver halide grains having average iodine content of from 3 to 40 mol%, and said photographic material further containing a polymer capable of providing a cation site in a fixing solution on the same side as the emulsion layer, wherein said polymer is present in said photographic material in an amount from 0.1 to 100 units of cation sites per mol of the total iodine in said photographic material.

4,812,392

METHOD AND APPARATUS FOR INCUBATING CELLS

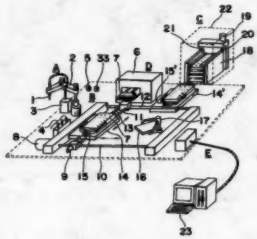
Shinichi Miyake, and Shinji Miyasaka, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 27, 1985, Ser. No. 814,246

Claims priority, application Japan, Dec. 27, 1984, 59-278996; Dec. 27, 1984, 59-280893

Int. Cl.[4] C12Q *3/00;* C12M *1/36*

U.S. Cl. 435—3 2 Claims



1. A method for incubating cells in a liquid culture medium contained in a transparent vessel, which comprises the steps of:

calculating the pH value of the culture medium containing cells to be incubated, from the ratio between the absorbencies of Phenol Red added to the culture, at two wavelengths of the absorption peak wherefrom the absorbance at a wavelength at which Phenol Red does not absorb is subtracted to account for the absorption of light by the cells, and,

in the event that the pH value so calculated deviates from a predetermined pH range, replacing the culture medium with a fresh culture medium of identical composition, all of said steps being carried out while said cells are maintained in a steady state within said transparent vessel.

4,812,393

FLUORESCENT DYES AND BIOLOGICAL AND ANALYTICAL USES THEREOF

Ramanuj Goswami, Rochester, and Chin H. Chen, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

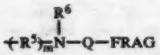
Filed Jan. 31, 1986, Ser. No. 824,765

Int. Cl.[4] G01N *33/54;* C12Q *1/00*

U.S. Cl. 435—4 13 Claims

1. A dry analytical element for the determination of an analyte comprising an absorbent carrier material and containing a reducible compound of the structure CAR—$(R^1)_n$

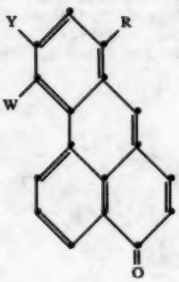
wherein CAR—is an aromatic or quinone nucleus having one or more hydrogen atoms removed to provide one or more valences through which R^1 is attached to CAR—, n is 1 or 2, and R^1 is



which is attached to CAR—in 1 or 2 places,

and wherein m is 0 or 1, R_5 is alkylene of 1 or 2 carbon atoms, R^6 is alkyl, cycloalkyl, heterocycle or aryl, Q is carbonyl or thiocarbonyl, and

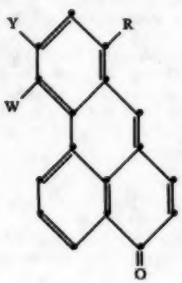
FRAG is a fluorescent moiety derived from a compound represented by the structure:



wherein R is hydrogen, alkyl, hydroxyalkyl or alkoxycarbonyl, W is hydrogen or an electron withdrawing group having a positive Hammett sigma value, and Y is hydroxy or mercapto,

said FRAG being attached to Q through said Y group having a hydrogen atom removed.

6. A method for distinguishing cells comprising contacting a biological sample containing cells with a compound represented by the structure:



wherein R is hydrogen, alkyl, hydroxyalkyl or alkoxycarbonyl, W is hydrogen or an electron withdrawing group having a positive Hammett sigma value, and Y is hydrogen, hydroxy, mercapto, amino, alkoxy, carbamyloxy, —O—M^+or —S—M^+wherein $M^+$is a monovalent cation.

4,812,394

FLOW CYTOMERIC MEASUREMENT OF DNA AND INCORPORATED NUCLEOSIDE ANALOGS

Frank A. Dolbeare, and Joe W. Gray, both of Livermore, Calif., assignors to University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 617,655, Jun. 5, 1984, Pat. No. 4,780,406, which is a continuation-in-part of Ser. No. 542,955, Oct. 18, 1983, Pat. No. 4,585,736. This application Feb. 24, 1986, Ser. No. 832,618

The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.

Int. Cl.[4] C12Q *1/68*

U.S. Cl. 435—6 **39 Claims**

1. A non-radioactive method for measuring unaltered cellular DNA and incorporated nucleoside analog, the method comprising the steps of:

growing a population of cells in the presence of a non-radioactive predetermined compound, the non-radioactive predetermined compound being capable of assimilation into the DNA of the cells of the population to form an incorporated nucleoside analog whose presence can be detected by an immunochemical stain;

altering a portion of the DNA of each cell of the population to substantially the same extent such that a first portion comprising altered DNA is formed and a second portion comprising unaltered DNA remains, the first portion being sufficiently large so that nucleoside analogs incorporated therein can be detected by an immunochemical stain specific for the incorporated nucleoside analog, and the second portion being sufficiently large so that G_1 phase cells of the population can be distinguished from the G_2M phase cells of the population by a second signal generated by a second stain specific for the second portion;

applying the immunochemical stain to the cells;

applying the second stain to the cells; and

detecting at substantially the same time and for each cell of a substantial portion of the population, a non-radioactive first signal from the immunochemical stain bound to the incorporated nucleoside analog in the first portion of DNA of each cell and a second signal from the second stain bound to the second portion of DNA of the same cell such that a first signal and a second signal are associated with each said cell of the substantial portion of the population.

4,812,395

METHOD FOR DETECTING ENZYMATIC ACTIVITY USING PARTICLE AGGLUTINATION

Robert A. Ballas, Newark, and William A. Frey, Wilmington, both of Del., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Division of Ser. No. 668,489, Nov. 5, 1984, abandoned. This application Aug. 19, 1986, Ser. No. 877,998

Int. Cl.[4] G01N *33/546, 33/547, 53/00*

U.S. Cl. 435—7 **21 Claims**

1. An agglutination based assay for detecting an analyte in a liquid test sample, comprising:

(1) contacting a sample suspected of containing an analyte with a conjugate comprising an enzyme and a first binding partner capable of binding to the analyte, whereby a fraction of the conjugate binds to the analyte to form a complex and a fraction of the conjugate remains free;

(2) separating the free conjugate from the complex;

(3) contacting either the free conjugate or the complex with an agglutination system comprising:

(i) highly refractive particles having a ligand disposed thereon,

(ii) a second binding partner capable of binding to at least two ligands, the second binding partner and particle bound ligand being present at concentrations which permit agglutination, and

(iii) a substrate for the enzyme, wherein said enzyme, said

substrate, said ligand and said second binding partner are selected such that a reaction between the enzyme and substrate produces a product which competes with the ligand for the second binding partner;

(4) measuring a physical property of the agglutination system, which property is a function of agglutination; and

(5) relating the measurement to the amount of analyte initially present in the sample.

4,812,396

METHOD FOR DETECTING ENZYMATIC ACTIVITY USING PARTICLE AGGLUTINATION

Robert A. Ballas, Newark, and William A. Frey, Hockessin, both of Del., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 668,489, Nov. 5, 1984, abandoned. This application Jul. 2, 1987, Ser. No. 69,235

Int. Cl.[4] G01N *53/00*

U.S. Cl. 435—7 17 Claims

1. An agglutination based method for detecting an enzyme in a liquid test sample comprising:

(1) forming an agglutination system comprising:

(i) highly refractive particles having a ligand disposed thereon,

(ii) a binding partner specific for the ligand and capable of binding to at least two ligands, the binding partner and ligand being present at concentrations which permit agglutiation, and

(iii) a substrate for an enzyme to be detected, wherein said enzyme, said substrate, said ligand and said binding partner are selected such that a reaction between the enzyme and substrate produces a product which competes with the ligand for the binding partner;

(2) contacting a test sample suspected of containing the enzyme with the agglutination system to produce the product which competes with the ligand for the binding partner;

(3) measuring a physical property of the agglutination system, which property is a function of agglutination; and

(4) relating the measurement to the amount of enzyme initially present in the test sample.

4,812,397

MAB-ANTI-DNA RELATED TO NEPHRITIS

Richard H. Weisbart, Los Angeles, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Feb. 10, 1987, Ser. No. 12,830

Int. Cl.[4] G01N *33/00, 33/53*

U.S. Cl. 435—7 22 Claims

1. A method for diagnosing one of systemic lupus nephritis or lupus erythematosus, said method comprising:

determining the presence in a blood sample of antibody capable of competing with an antibody composition having the following characteristics: specifically binding to all of the ligands poly-dT, ssDNA and nDNA; poly-dT and poly-dI inhibit binding of said antibody composition to ssDNA while the other poly-dNs do not inhibit binding of said antibody composition to ssDNA; said competition with said blood sample antibody being for at least one of said ligands; or

determining the presence of antibody in said blood sample which binds the idiotype of said antibody composition;

wherein the presence of competing antibody is indicative of lupus nephritis and the presence of idiotype binding antibody is indicative of systemic lupus erythematosus and contraindicative of lupus nephritis.

4,812,398

REAGENT FOR MEASURING AMYLASE ACTIVITY AND MEASURING METHOD THEREOF

Hitoshi Kondo, Kyoto, and Masao Kageyama, Joyo, both of Japan, assignors to Unitika Ltd., Hyogo, Japan

Filed May 9, 1986, Ser. No. 861,306

Claims priority, application Japan, May 9, 1985, 60-98282

Int. Cl.[4] C12Q *1/54, 1/40*

U.S. Cl. 435—14 9 Claims

1. A reagent for measuring amylase activity in body fluids by cleaving an oligosaccharide having a defined chain length with amylase in body fluids to produce a glucose and measuring said glucose, characterized in that the reagent is divided into two portions, the first portion comprises an enzyme for converting a glucose and/or maltose naturally present in body fluids to glucose-6-phosphate, and also containing phosphoglucose isomerase, phosphofructokinase and adenosine-5'-triphosphate, and the second portion comprises said oligosaccharide being used as a substrate and a phosphoric acid ester of saccharides and/or saccharic acids.

6. A method for measuring amylase activity in body fluids comprising;

eliminating glucose and/or maltose naturally present in body fluids with a first reagent comprising an enzyme for converting the glucose and/or maltose to glucose-6-phosphate, and also containing phosphoglucose isomerase, phosphofructokinase and adenosine-5'-triphosphate,

adding a second reagent comprising a oligosaccharide substrate and a phosphoric acid ester of saccharides and/or saccharic acids to eliminate the phosphoglucose isomerase activity and to convert the oligosaccharide fragments formed by the action of amylase in body fluids to glucose by means of alpha-glucosidase or maltose phosphorylase, and measuring the amount of the obtained glucose.

4,812,399

ANALYTICAL ELEMENT AND METHOD FOR THE DETERMINATION OF CREATININE OR CREATINE

John C. Mauck; Linda A. Mauck, and Gary E. Norton, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 21, 1986, Ser. No. 854,460

Int. Cl.[4] C12Q *1/34*

U.S. Cl. 435—18 20 Claims

1. An analytical element for the determination of either creatinine or creatine comprising an absorbent carrier material containing creatinine amidohydrolase, creatine amidinohydrolase, sarcosine oxidase and a leuco dye which is capable of providing a detectable dye in the presence of hydrogen peroxide and a peroxidative substance,

either or both of said creatine amidinohydrolase and leuco dye being present in encapsulated form or, both being physically isolated from each other until an assay for creatinine or creatine is carried out, and said creatinine amidohydrolase being present in a rate limiting amount.

6. A multilayer analytical element for the determination of either creatinine or creatine comprising a support having thereon, in order,

a first reagent layer containing sarcosine oxidase, a rate limiting amount of creatinine amidohydrolase, a peroxidative substance and an imidazole leuco dye which is capable of providing a detectable dye in the presence of said peroxidative substance and hydrogen peroxide,

a second reagent layer containing creatine amidinohydrolase, and

a porous spreading layer.

4,812,400

PROCESS FOR MEASURING SODIUM LEVELS IN BIOLOGICAL FLUIDS

Gary D. Steinman, 150-38 Union Turnpike, Apt. 1-0, Flushing, N.Y. 11367

Filed Jul. 14, 1986, Ser. No. 885,412
Int. Cl.[4] C12Q *1/42, 1/00, 1/34, 1/48*
U.S. Cl. 435—21 11 Claims

1. A process for measuring the sodium concentration of a biological fluid, comprising the steps of:

(a) supplying predetermined amounts of adenosine-5'-triphosphate (ATP), adenosine triphosphatase (ATPase), magnesium, and potassium in the presence of a buffer in a reaction mixture for enzymatic Reaction I,

$$ATP + H_2O \xrightarrow[Na^+K^+Mg^{+2}]{ATPase} ADP + \text{phosphate}, \quad (I)$$

where ADP is adenosine diphosphate and where the reactants and containers used to carry out the process are of known initial sodium content;

(b) adding a biological fluid test sample and then measuring the rate of appearance of the products in Reaction I so that the reaction rate of adenosine triphosphatase, being proportional to the concentration of sodium, is determined;

(c) comparing the reaction rate of adenosine triphosphatase in Reaction I against the reaction rate of the same in one standard of known sodium concentration (in the range 130–150 mEq/L; and

(d) then determining the sodium concentration of said biological fluid.

4. The process according to claim 1, wherein the ADP product from Reaction I is measured using coupled Reactions II, IV, and V,

$$ADP + PEP \xrightarrow[K^+Mg^{+2}]{\text{pyruvate kinase}} ATP + \text{pyruvate} \quad (II)$$

$$\text{pyruvate} + \text{oxygen} \xrightarrow[P_i\ TPP\ FAD]{\text{pyruvate oxidase}} \quad (IV)$$

$$CH_3COO{-}H_2PO_3 + H_2O_2$$

$$H_2O_2 + TMBZ \xrightarrow{\text{peroxidase}} \text{color}, \quad (V)$$

where TPP is thiamine pyrophosphate, FAD is flavin adenine dinucleotide, Pi is inorganic phosphate, and TMBZ is tetramethylbenzidine, in a spectrophotometer against at least one analytical standard of known concentration (in the range 130–150 Na mEq/L, the optical density of the produced color, as a function of time, being directly proportional with the sodium concentration of said biological fluid.

4,812,401

REVERSIBLE AGGLUTINATION MEDIATORS FOR SEPARATING CELLS FROM WHOLE BLOOD

Thomas L. Tarnowski, South San Francisco; Cheng-I Lin, San Jose, and Edwin F. Ullman, Atherton, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed May 19, 1987, Ser. No. 51,978
Int. Cl.[4] C12Q *1/02*
U.S. Cl. 435—29 20 Claims

1. A method for separating cells from whole blood, which comprises:

combining a whole blood sample, charged magnetic particles and a polyionic reagent for non-specifically agglutinating said magnetic particles and said cells, said polyionic reagent being capable of being cleaved by a chemical reagent whereby said agglutination is reversed;

subjecting said medium to a magnetic field gradient to separate said agglutinated cells from blood plasma; and

contacting said agglutinated cells with an aqueous solution of said chemical reagent under conditions for reversing said agglutination by at least partial depolymerization by cleaving at least some of the bonds within said polyionic reagent.

4,812,402

METHOD OF DETERMINING HYPERSENSITIVITY TO AN ALLERGEN

Tomas Nilsson, Borås, Sweden, assignor to Bio-Instructa Labkonsult, Sweden

Continuation of Ser. No. 683,399, Dec. 17, 1984, abandoned. This application Feb. 19, 1988, Ser. No. 159,514
Int. Cl.[4] C12Q *1/04*
U.S. Cl. 435—29 9 Claims

1. A method of testing a patient for hypersensitivity to an allergen comprising the steps of

(a) providing a sample containing basophilic leucocytes from the blood of said patient;

(b) contacting said sample with said allergen at a concentration level below the degranulation reaction threshold concentration;

(c) increasing the concentration level of said allergen in said sample by addition of allergen to said sample until the concentration level is above said threshold concentration, said addition being at a rate slow enough, such that said basophilic leucocytes have sufficient time to undergo degranulation;

(d) measuring the amount of degranulated basophilic leucocytes as a measure of the hypersensitivity of said patient to said allergen.

4,812,403

OPTICALLY ACTIVE SUBSTITUTED BUTYRAMIDE, AND PROCESS FOR THE OPTICAL SEPARATION OF SUBSTITUTED BUTYRAMIDE

Wilhelmus H. J. Boesten, Sittard, and Peter J. H. Peters, Geleen, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Jan. 22, 1985, Ser. No. 693,352
Claims priority, application Netherlands, Feb. 2, 1984, 8400312
Int. Cl.[4] C12P *13/08, 7/52;* C07P *41/00;* C12N *9/48*
U.S. Cl. 435—115 4 Claims

1. The process for preparing D-2-amino-2,3-dimethylbutyramide and/or L-2-amino-2,3-dimethylbutyric acid comprising:

enzymatically hydrolyzing DL-2-amino-2,3-dimethylbutyramide by contacting an aqueous solution of DL-2-amino-2,3-dimethylbutyramide with a preparation containing an aminoacyl amidase obtained from a culture of *Mycobacterium neoaurum* ATCC 25795 whereby a hydrolysis mixture is obtained; and

recovering D-2-amino-2,3-dimethylbutyramide and/or L-2-amino-2,3-dimethylbutyric acid from the thus obtained hydrolysis mixture.

4,812,404

APATITE IMMOBILIZED GLUCANASE

Yoshinori Kuboki, Chiba; Daisaburo Fujimoto, Hamamatsu; Hideki Aoki, and Keijiro Fujita, both of Tokyo, all of Japan, assignors to Dental Kagaku Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 25, 1986, Ser. No. 878,256
Claims priority, application Japan, Sep. 20, 1985, 60-206677
Int. Cl.[4] C12N *11/18, 11/14, 9/36, 9/46*
U.S. Cl. 435—175 10 Claims

1. A method for preparing an apatite having glucanase immobilized therein, comprising adding dropwise glutaraldehyde to an aqueous solution in which glucanase, lysozyme and apatite are present in a mixed state and recovering an apatite having glucanase immobilized therein.

4,812,405

DOUBLE AUXOTROPHIC MUTANTS OF *PICHIA PASTORIS* AND METHODS FOR PREPARATION

Stephen V. Lair, La Jolla, and Mary E. Digan, San Diego, both of Calif., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 18, 1986, Ser. No. 830,304
Int. Cl.[4] C12N *1/16, 15/00;* C12R *1/84*
U.S. Cl. 435—255 2 Claims

1. A yeast cell of the species *Pichia pastoris* as a host capable of being transformed with recombinant DNA material, wherein said host is defective in histidinol dehydrogenase activity and in argininosuccinate lyase activity.

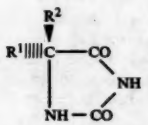
4,812,406

PROCESS FOR PREPARING OPTICALLY ACTIVE HYDANTOINS

Satomi Takahashi, Kobe; Yukio Yamada, Kakogawa; Yasuyoshi Ueda; Yasuhiro Katayama, both of Takasago; Yoshio Shimada, Kakogawa, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

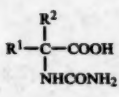
Filed Sep. 12, 1985, Ser. No. 775,890
Claims priority, application Japan, Sep. 17, 1984, 59-195392
Int. Cl.[4] C12P *17/10, 13/04*
U.S. Cl. 435—280 16 Claims

1. A process for preparing an optically active hydantoin having the general formula (II):



(II)

wherein R^1 and R^2, which are different from each other, are independently alkyl group, aralkyl group, aryl group, substituted alkyl group, substituted aralkyl group, or substituted aryl group, or R^1 and R^2 form an asymmetric cyclic compound, which comprises subjecting a racemic N-carbamoyl-α-amino acid having the general formula (I):



(I)

wherein R^1 and R^2 are as above, to the action of an enzyme capable of converting one enantiomer of said N-carbamoyl-α-amino acid to said optically active hydantoin, and recovering said optically active hydantoin.

4,812,407

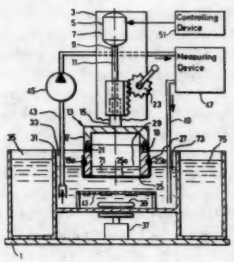
MEMBRANE, SYSTEM AND PROCESS FOR TESTING SUBSTANCE DIFFUSION THROUGH THE MEMBRANE AND METHOD FOR MAKING THE MEMBRANE

Stephan Buchmann, Munchenstein; Hans Leuenberger, Pfeffingen, both of Switzerland, and Claudia Reinke, Freiburg Im Breisgau, Fed. Rep. of Germany, assignors to Pharmatronic AG, Prattein, Switzerland

Filed Apr. 14, 1987, Ser. No. 38,285
Claims priority, application Switzerland, Apr. 15, 1986, 1496/86
Int. Cl.[4] C12M *1/34*
U.S. Cl. 435—291 29 Claims

1. Membrane suitable for use in testing the diffusion of a substance through said membrane, so as to simulate the absorption—by an organism—of an active substance or an auxiliary substance in a medicine, or of a cosmetic substance, or of a substance to be used in the treatment of plants wherein the membrane comprises a sheet-like, liquid permeable or semipermeable, transparent carrier made of lifeless material, and cells supported by the carrier, which are derived from at least one monocellular or multicellular organism.

17. System for testing the diffusion of a substance through a membrane so as to simulate the absorption—by an organism—of an active substance or an auxiliary substance in a medicine, or of a cosmetic substance, or of a substance to be used in the treatment of plants, the system comprising a supporting device, a rotor held by said supporting device rotatably around a vertical axis, a driving mechanism for rotating the rotor, a wall member detachably connected to a part of the rotor and adapted to detachably hold the membrane, and which—together with the membrane—is adapted to bound said first compartment, said two compartments being so constructed, that during the diffusion test a liquid provided in the second compartment is brought in contact with the lower side of at least one region of the membrane, a positioning mechanism being adapted to displace said part of the rotor and said second compartment relative to each other along said axis, said membrane comprising a sheet-like, liquid permeable or semipermeable, transparent carrier made of lifeless material, and cells supported by the carrier which are derived from at least one monocellular or multicellular organism.



20. Process for testing the diffusion of a substance through a membrane so as to simulate the absorption—by an organism—of an active substance or an auxiliary substance in a medicine, or of a cosmetic substance, or of a substance to be used in the treatment of plants, the process comprising the steps:

(a) mounting said membrane comprising a sheet-like, liquid permeable or semipermeable, transparent carrier made of lifeless material on a front face of a sleeve-shaped wall member, a first compartment bounded by said wall member and said membrane being thus defined;

(b) populating the carrier with living cells derived from at least one monocellular or multicellular organism so that the carrier is a support therefor, the cells on the carrier being microscopially examined at least once by use of light passing through the carrier;

(c) connecting subsequently the wall member together with the membrane with a rotor held in a supporting device so as to enable rotation around a vertical axis of said wall member, contacting the first compartment with a liquid containing said substance provided in a second compartment, and rotating around said vertical axis; and

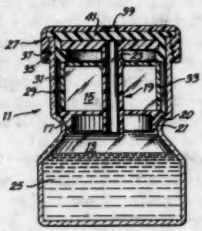
(d) determining the quantity of the substance passed through the membrane from one of the compartments into the other compartment.

4,812,408

BLOOD CULTURE SYSTEM

Rainer Hammann, Weisenbach; Friedrich Weber, Heildelberg, and Peter Röhm, Plankstad, all of Fed. Rep. of Germany, assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 171,215, Mar. 17, 1988, abandoned, which is a continuation of Ser. No. 56,518, Jun. 1, 1987, abandoned. This application Aug. 24, 1988, Ser. No. 235,765
Int. Cl.[4] C12M 1/24
U.S. Cl. 435—296 8 Claims



1. A culture bottle assembly comprising:

1. a container, said container having a first lower compartment for receiving a fluid culture medium and a second upper compartment,
2. a flange on the interior of the container separating said first compartment from said second compartment,
3. a frame for holding a solid culture medium tray member adapted for insertion into said second compartment, said frame having a lower edge with a periphery and resilient material around the periphery of the lower edge,
4. a closure means for said container, and
5. means for moving said resilient material axially with respect to said container from a sealed position to an open position whereby in the sealed position said resilient material of said frame engages said flange to provide a liquid tight seal between said first compartment and said second compartment and in the open position fluid communication exists between said first and second compartments.

4,812,409

HYDROLYZABLE FLUORESCENT SUBSTRATES AND ANALYTICAL DETERMINATIONS USING SAME

Bruce E. Babb, Rochester; Robert T. Belly, Webster, and Patricia M. Scesney, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 31, 1986, Ser. No. 824,756
Int. Cl.[4] G01N 33/53
U.S. Cl. 435—7 18 Claims

1. A hydrolyzable compound represented by the formula:

BLOCK—X—R/—L

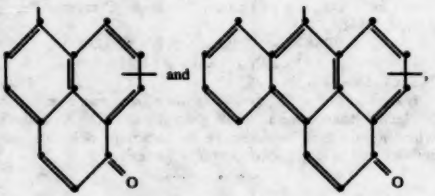
wherein BLOCK is a hydrolyzable group selected from the group consisting of:

—COR^1; a monovalent moiety derived by removal of a hydroxy group from a carboxy group of an amino acid or peptide; or a monovalent moiety derived by removal of a hydroxy group from a mono- or polysaccharide,

R^1 is hydrogen, alkyl, alkenyl, aryl, cycloalkyl or a heterocyclic group,

X is —O—, —S— or —NR— and is attached to BLOCK at the open valence on BLOCK wherein R is hydrogen, alkyl, cycloalkyl, phenyl or a heterocyclic group,

R/ is a phenalenone or benzphenalenone fluorescent moiety selected from the group consisting essentially of



provided that when released as —X—R/—L, —X—R/—L exhibits maximum fluorescent emission at least about 580 nm at a pH of 9 or less, and L is hydrogen or a specific binding ligand.

13. A method for the determination of a hydrolytic analyte comprising the steps of:

A. under hydrolyzing conditions, contacting a sample of a liquid suspected of containing a hydrolytic analyte with a hydrolyzable compound represented by the formula:

BLOCK—X—R/—L

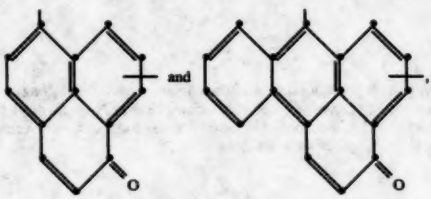
wherein BLOCK is a hydrolyzable group selected from the group consisting of:

—COR^1; a monovalent moiety derived by removal of a hydroxy group from a carboxy group of an amino acid or peptide; or a monovalent moiety derived by removal of a hydroxy group from a mono- or polysaccharide,

R^1 is hydrogen, alkyl, alkenyl, aryl, cycloalkyl or a heterocyclic group,

X is —O—, —S— or —NR— and is attached to BLOCK at the open valence on BLOCK, wherein R is hydrogen, alkyl, cycloalkyl, phenyl or a heterocyclic group,

R/ is a phenalenone or benzphenalenone fluorescent moiety selected from the group consisting essentially of



provided that when released as —X—R/—L, —X—R/—L exhibits maximum fluorescent emission at least about 580 nm and maximum absorption above about 530 nm at a pH of 9 or less, and L is hydrogen or a specific binding ligand, and

B. determining the fluorescent moiety released from said compound by hydrolysis as a result of the presence of said hydrolytic analyte at a wavelength at least about 580 nm after excitation at a wavelength above about 530 nm.

15. The method of claim 13 for the determination of a hydrolytic enzyme.

16. The method of claim 13 which is a competitive binding assay.

18. The method of claim 13 for the determination of *Klebsiella pneumoniae* or *Enterobacter cloacae* wherein BLOCK is derived from a monosaccharide.

4,812,410

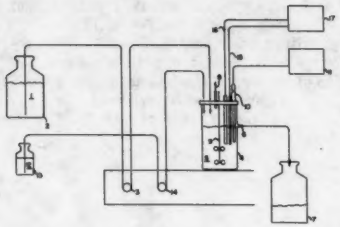
CONTINUOUS PROCESS FOR ETHANOL PRODUCTION BY BACTERIAL FERMENTATION

Hugh G. Lawford, Mississauga, Canada, assignor to George Weston Limited, Toronto, Canada

Continuation of Ser. No. 722,492, Apr. 12, 1985. This application May 20, 1985, Ser. No. 735,913

Int. Cl.[4] C12P 7/06; C12N 1/20, 1/38

U.S. Cl. 435—161 18 Claims



1. A continuous process for the production of ethanol, which comprises

feeding an aqueous substrate solution substantially continuously to a fermentation medium containing a submerged culture of an organism of the genus Zymomonas;

cultivating said organism under anaerobic conditions at a temperature of about 33° C. to about 37° C. in an aqueous nutrient medium containing potassium and assimilable carbon, nitrogen and phosphorus until a recoverable quantity of ethanol is produced;

wherein said nutrient medium is limited in assimilable nitrogen such that the rate of growth of said organism is limited by the availability of assimilable nitrogen, and said nutrient medium contains said limiting nutrient in a concentration proportional to temperature of said fermentation medium, such that limiting nutrient concentration is increased as temperature increases and is decreased as said temperature decreases;

and wherein said process is conducted as a nutrient-limited fermentation and under conditions such that biomass expresses its maximal value for both q_s and q_p under conditions of nutrient limitation and said process is conducted at a lower concentration of substrate in effluent from the process than from a similar process conducted with a nutrient medium containing nitrogen in excess;

and wherein each of said processes is carried out at the same fermentation temperature, dilution rate and concentration of assimilable carbon.

4,812,411

METHOD OF PERFORMING MEDICAL ANALYSES, AND A CONDITIONING STRIP AND APPARATUS FOR PERFORMING THE METHOD

Jean Guigan, 9, rue Jean Mermoz, 75008 Paris, France

Filed Dec. 16, 1985, Ser. No. 808,970

Claims priority, application France, Dec. 21, 1984, 84 19719

Int. Cl.[4] C12M 1/20; G01N 21/07

U.S. Cl. 435—293 6 Claims

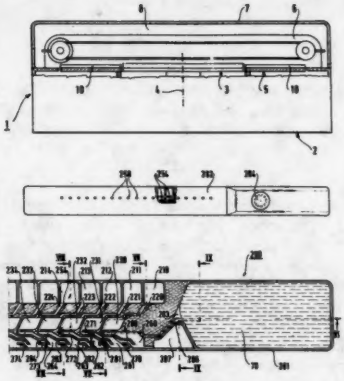
1. A conditioning strip for facilitating medical analyses of the identify biogram and of the antibiogram type and for placement in a thermostatically controlled enclosure containing:

a central turntable;

a peripheral ring which is coplanar and coaxial with the central turntable, said ring including radial housings for a plurality of such conditioning strips, and being mounted for step-by-step rotation; and

a gantry extending diametrically over the rotary assembly and supporting optical means such as a turbidimeter and a photometer;

said strip comprising a container and a lid made of transparent plastic material, said strip having a first end fitted with a culture enclosure closed by a stopper and suitable for containing a liquid culture medium, said culture enclosure opening out into a first overflow chamber and communicating in turn via a capillary channel with a first measuring antechamber and a duct with a second overflow chamber, said first measuring antechamber communicating via a first capillary duct with a first reaction chamber suitable for containing a reagent, said second overflow chamber communicating in turn with a second measuring antechamber and with a third overflow chamber, said second measuring antechamber also communicating with a second reaction chamber, and so on up to an n-th overflow



chamber, and an n-th measuring antechamber and its associated n-th reaction chamber and an end overflow chamber, the n measuring antechambers being aligned and lying in the middle of the container, the n reaction chambers and the n overflow chambers being respectively aligned along the two longitudinal side walls of said container and being longitudinally offset towards said culture enclosure relative to the n measuring antechambers, the volume of said measuring antechambers being less than the volume of said reaction chambers.

4,812,412

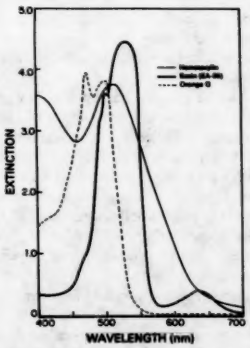
STANDARD SPECIMEN AND METHOD OF MAKING AND USING SAME

James N. Turner, Delmar, N.Y., assignor to Health Research Inc., Albany, N.Y.

Filed Feb. 26, 1987, Ser. No. 19,063

Int. Cl.[4] G01N 31/00

U.S. Cl. 436—15 21 Claims



1. A standard specimen for the quantitative evaluation of

stain performance in staining processes which utilize dyes to stain cells or tissues which stained cells or tissue exhibit characteristic spectra when subjected to light transmission analysis, which standard specimen comprises a uniform amount of biological material extracted from cells or tissue incorporated into a plastic matrix which specimen-containing matrix is capable of being reproduced and which specimen-containing matrix is sectioned to a controlled thickness and stained and mounted and which specimen-containing matrix presents a uniform field constant from one area of the specimen-containing matrix to the next, and which exhibits spectra substantially the same as the characteristic spectra of the cells or tissue stained when subjected to light transmission analysis.

4,812,413

REAGENT, PROCESS AND KIT FOR DRUG DETECTION

Baruch Glattstein, and Abraham Aseria, both of Jerusalem, Israel, assignors to Erez Forensic Technology, Ltd., Israel

Filed Mar. 17, 1987, Ser. No. 26,614

Int. Cl.[4] G01N *33/00, 21/78*

U.S. Cl. 436—92 **15 Claims**

1. An aerosol spray reagent for the presumptive identification of a prohibited drug such as cocaine, cocaine salts and phencyclidene which comprises cobalt thiocyanate, a polyol in which said drugs are selectively soluble, a halogenated alkane propellant, a non-ionic emulsifier different from said polyol and a silicon anti-foam agent.

14. A process for the presumptive identification of cocaine, cocaine salts and phenylcyclidene, comprising the steps of spraying an aerosol spray reagent comprising cobalt thiocyanate, a polyol, an aliphatic aerosol propellant, a non-ionic emulsifier different from said polyol and a silicon antifoam agent, to a first sample of a suspected drug and then contacting therewith a second reagent which produces a color reaction in the presence of a diazotisable amine.

4,812,414

IMMUNOREACTIVE REAGENT PARTICLES HAVING TRACER, RECEPTOR MOLECULES AND PROTEIN OF PI LESS THAN 6

Harold C. Warren, III, Rush, and Brian A. Snyder, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 18, 1987, Ser. No. 98,250

Int. Cl.[4] G01N *33/546, 33/547, 33/569*

U.S. Cl. 436—533 **20 Claims**

16. A method for the determination of an immunoreactive species in an aqueous liquid comprising:

(a) contacting said liquid with an immunoreactive reagent comprising water-insoluble particles having tracer molecules associated therewith, and having bound to the outer surface of said particles:

(i) receptor molecules reactive with an immunoreactive species, and

(ii) molecules of a protein having a pI less than about 6, which protein is reactive with either of said immunoreactive species or said receptor molecules,

wherein the weight ratio of said receptor molecules to said protein molecules is from about 100:1 to about 1:10,

said molecules (i) and (ii) being attached to said particles such that there is substantially no coating of either of said molecules over each other,

so as to form a reaction product of said species and said receptor molecules,

(b) separating said reaction product from unreacted materials, and

(c) determining the amount of tracer either in said reaction product or said unreacted materials.

4,812,415

METHOD FOR MAKING SEMICONDUCTOR DEVICE FREE FROM ELECTRICAL SHORT CIRCUITS THROUGH A SEMICONDUCTOR LAYER

Shunpei Yamazaki, Tokyo; Kunio Suzuki; Mikio Kinka, both of Atsugi; Takeshi Fukada, Ebina; Masayoshi Abe, Tokyo; Ippei Kobayashi, Atsugi; Katsuhiko Shibata, Atsugi; Masato Susukida, Atsugi; Susumu Nagayama, Tokyo, and Kaoru Koyanagi, Saku, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Japan

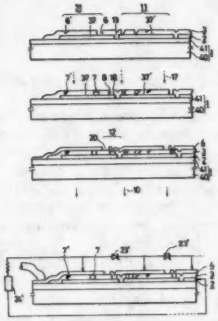
Division of Ser. No. 909,202, Sep. 19, 1986. This application Aug. 6, 1987, Ser. No. 82,115

Claims priority, application Japan, Sep. 21, 1985, 60-209595; Sep. 21, 1985, 60-209296; Nov. 6, 1985, 60-248640

The portion of the term of this patent subsequent to Nov. 22, 2005, has been disclaimed.

Int. Cl.[4] H01L *31/18*

U.S. Cl. 437—2 **6 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:

forming a first electrode on a substrate;

forming a continuous semiconductor layer on the first electrode, said layer undesirably having gaps formed therein;

coating the surface of said semiconductor layer with a positive photoresist to fill the gaps with said photoresist;

irradiating said photoresist from the photoresist side of said substrate to the extendt that at least a portion of said photoresist residing in said gaps becomes fixed;

removing the unfixed portion of said photoresist to thus plug the gaps with the fixed photoresist;

forming a second electrode on said semiconductor layer; and

applying reverse voltage to the semiconductor layer subsequent to forming the second electrode.

4,812,416

METHOD FOR EXECUTING A REPRODUCIBLE GLOW DISCHARGE

Gerd Hewig, Kastanienweg 15a, D-8755 Alzenau; Berthold Schum, Bornweg 44, D-6465 Biebergemünd, and Jörg Wörner, Philipp-Reis-Strasse 16, D-6451 Grosskrotzenburg, all of Fed. Rep. of Germany

Filed Nov. 28, 1986, Ser. No. 936,089

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1985, 3542111

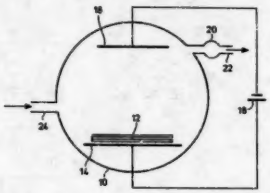
Int. Cl.[4] H01L *31/18*

U.S. Cl. 437—5 **9 Claims**

1. Method for the execution of a reproducible glow discharge process by tracing mass spectrometrically the temporal course of the partial pressure of volatile stable reaction products in the plasma with a reactant located in a glow discharge column for the manufacture of a $Cu_{2-x}S/CdS$ thin film semiconductor solar cell with $0 \leqq x \leqq 1$, in which the $Cu_{2-x}S$ layer

is exposed to a glow discharge process in a hydrogen atmosphere, which includes the steps of:

(a) reduction by the glow discharge of $Cu_{2-z}O$ with $0 \leqq z \leqq 1$ present on the $Cu_{2-x}S$ layer and of excess sulphur ions from the $Cu_{2-x}S$ layer until a highly stoichiometric $Cu_{2.0000}S$ layer is produced;



(b) formation of an inversion layer on and from the highly stoichiometric $Cu_{2.0000}S$ layer by way of adsorption of negatively charged hydrogen atoms (H^- ions) from the hydrogen atmosphere of the glow discharge; and

(c) reduction of the free surface of the inversion layer to elemental copper.

4,812,417

METHOD OF MAKING SELF ALIGNED EXTERNAL AND ACTIVE BASE REGIONS IN I.C. PROCESSING

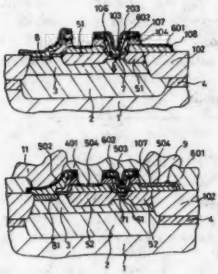
Tadashi Hirao, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 30, 1987, Ser. No. 79,708

Claims priority, application Japan, Jul. 30, 1986, 61-179738; Aug. 6, 1986, 61-185732; Nov. 7, 1986, 61-266452

Int. Cl.[4] H01L *21/265, 21/22*

U.S. Cl. 437—31 **20 Claims**



1. A method of producing a structure for a semiconductor integrated circuit device, comprising the steps of:

forming a semiconductor substrate;

successively forming a first silicon film, a first oxide film and a nitride film on said semiconductor substrate;

selectively removing a first portion of said first nitride film and said first oxide film, thereby forming an exposed portion of said first silicon film;

producing a selective oxide film by selectively oxidizing said exposed portion of said first silicon film, whereby a second remaining portion of said first nitride film and said first oxide film acts as a mask for preventing oxidation of said second remaining portion;

forming an external base region by diffusing external base impurities into said semiconductor substrate, whereby said selective oxide film acts as a mask for preventing said external base impurities from being diffused into said semiconductor substrate;

removing said selective oxide film; and

selectively injecting active base impurities into said semiconductor substrate to form an active base layer, whereby said second remaining portion acts as a mask for self-aligning said active base layer.

4,812,418

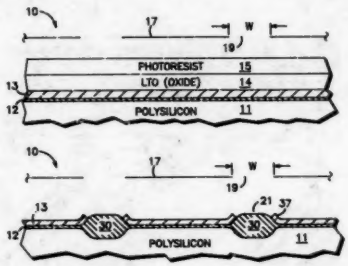
MICRON AND SUBMICRON PATTERNING WITHOUT USING A LITHOGRAPHIC MASK HAVING SUBMICRON DIMENSIONS

James R. Pfiester; Louis C. Parrillo, and J. William Dockrey, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 27, 1987, Ser. No. 125,972

Int. Cl.[4] H01L *21/316, 21/318, 21/32*

U.S. Cl. 437—069 **11 Claims**



1. A method of forming a pattern in a semiconductor device comprising the steps of:

providing a layer of substrate material;

providing a layer of oxide material above the substrate material;

providing a layer of etchable mask material above the oxide material;

providing a layer of buffer material above the layer of etchable mask material;

providing a layer of photoresist material above the layer of buffer material;

positioning a photolithographic mask above the layer of photoresist material, said photolithographic mask having a predetermined pattern formed thereon including at least one opening having a first width;

irradiating the layer of photoresist materisal with light thru the at least one opening of the photolithographic mask and developing the photoresist material to form the predetermined pattern in the layer of photoresist, said predetermined pattern defining at least one cavity area in the photoresist material;

etching the layers of buffer material, etchable mask material and oxide material with an etchant said etchant etching the at least one cavity area to the layer of substrate material thereby dividing the oxide material, said etchant reacting with the layer of buffer material to form sloped sides in the cavity area to expose the substrate material a second width which is substantially less than the first width;

completely removing any remaining buffer material; forming oxide in the at least one cavity area; and removing the etchable layer of mask material.

4,812,419

VIA CONNECTION WITH THIN RESISTIVITY LAYER

Keunmyung Lee, Redwood City, and Yoshio Nishi, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 30, 1987, Ser. No. 45,002

Int. Cl.[4] H01L *11/00*

U.S. Cl. 437—203 **12 Claims**

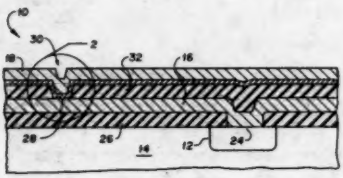
1. A method of forming via connections in an integrated circuit comprising,

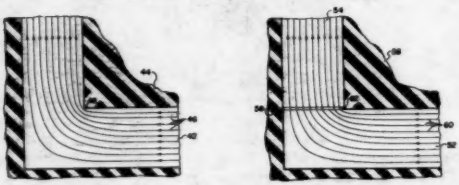
forming a first level of first electrically conductive lines connected to individual circuit elements on a semiconductor chip,

applying a layer of insulative material on said first level,

creating a plurality of holes in said layer of insulative material, said holes being formed over and exposing portions of said first electrically conductive lines,

depositing a thin layer of electrically conductive material in said holes, said thin layer contacting said first conductive lines, said thin layer characterized by a resistivity in a range from about 10 to about 50 times a resistivity of said first conductive lines and a thinness in a range of between 50 nanometers and 100 nanometers, and





forming a second level of second electrically conductive lines, said second lines extending into said holes into contact with said thin layer, said second lines having a resistivity which is approximately equal to said resistivity of said first lines,

whereby said thin layer of electrically conductive material in said holes determines local current density of a current conducted through said holes between said first lines to said second lines.

4,812,420

METHOD OF PRODUCING A SEMICONDUCTOR DEVICE HAVING A LIGHT TRANSPARENT WINDOW

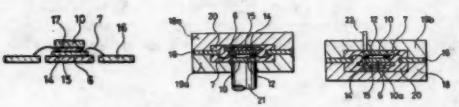
Sadamu Matsuda, Sakai; Kunito Sakai, Itami, and Takashi Takahama, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1987, Ser. No. 102,610

Claims priority, application Japan, Sep. 30, 1986, 61-234088; May 13, 1987, 62-116097

Int. Cl.[4] H01L *21/56*

U.S. Cl. 437—209 **21 Claims**



1. A method of producing a semiconductor device having a light transparent window, comprising the steps of:

die bonding a semiconductor chip onto a lead frame;

attaching a wall surrounding a picture element of said chip to an external contour surface of said chip;

inserting said chip and said light transparent window into a metal mold and forming an empty closed space between said chip and said light transparent window via said wall; and

plastic molding the device except for said light transparent window by filling resin into said metal mold and hardening said resin.

4,812,421

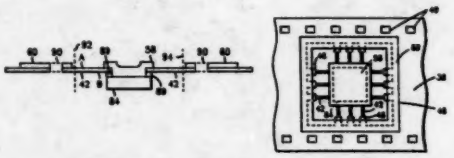
TAB-TYPE SEMICONDUCTOR PROCESS

Richard H. Jung, Park Ridge, and Philip R. Logadon, Arlington Heights, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 26, 1987, Ser. No. 112,593

Int. Cl.[4] H01L *21/66*

U.S. Cl. 437—211 **6 Claims**



1. A process for forming a TAB-type semiconductor structure, comprising:

(a) providing a semiconductor chip having a first surface and having chip bonding pads that are accessible from the first surface;

(b) providing a metal tape that has a pattern of conductive beam leads formed thereon, the beam leads each having one bondable end that is to be bonded to a chip bonding pad and an opposite end that includes a test pad;

(c) bonding the bondable ends of the beam leads to the chip bonding pads;

(d) providing a polymer material that is shaped to include a central portion that is at least as large as the first surface of the chip, and a peripheral portion surrounding the central portion and substantially separated from the central portion by openings in the material;

(e) bonding the polymer material to the chip and to the beam leads such that the central portion of the polymer material covers at least the first surface of the chip to form a protective layer thereon, and the peripheral portion of the polymer material covers at least part of each test pad on the beam leads to provide support for the beam leads; and

(f) excising the test pads from the beam leads along with the peripheral portion of the polymer material that covers the excised test pads.

4,812,422

DIELECTRIC PASTE AND METHOD OF MANUFACTURING THE PASTE

Satoru Yuhaku, Osaka; Seiichi Nakatani, Neyagawa; Tsutomu Nishimura, Uji, and Toru Ishida, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 3, 1986, Ser. No. 869,904

Claims priority, application Japan, Jun. 17, 1985, 60-131101; Jun. 27, 1985, 60-140804

Int. Cl.[4] C03C *8/16, 8/14*

U.S. Cl. 501—20 **3 Claims**

1. A dielectric paste which comprises a ceramic comprising 90 to 98 wt.% of Al_2O_3, 1 to 5 wt.% of SiO_2, 0.2 to 2 wt.% of CaO, and 0.5 to 4 wt.% of MgO, with the total weight reaching 100%; a borosilicate glass; and an organic liquid vehicle wherein the ratio of the glass to the ceramic by weight is 40/60 to 60/40.

4,812,423

OPTICAL LIGHT WEIGHT GLASS

Hiroyuki Kodama, Kawasaki; Katsumi Mangyo, Yokohama, and Takeo Ichimura, Tokyo, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Jul. 17, 1985, Ser. No. 758,648

Int. Cl.[4] C03C *3/076, 4/00*

U.S. Cl. 501—55 **2 Claims**

1. Optical lens of light-weight glass consisting essentially of the following composition in % by weight and having a refractive index (n_d) of 1.58 through 1.65, and Abbe number (ν_d) of 35 through 50 and a specific gravity of 2.69 or less:

SiO_2	47–70
Li_2O	5.5–21
K_2O	2–30
$Li_2O + K_2O$	21–50
TiO_2	9.5–24
CaO	0–20
$MgO + SrO + BaO + ZnO$	0–4
Al_2O_3	0–5
$ZrO_2 + La_2O_3 + Ta_2O_5 + WO_3$	0–3.

4,812,424

KILN FURNITURE FOR THE FIRING OF CERAMIC ARTICLES

Richard L. Helferich, Clayton, and Robert C. Schenck, Kettering, both of Ohio, assignors to The Duriron Company, Inc., Dayton, Ohio

Filed Dec. 2, 1987, Ser. No. 127,808
Int. Cl.[4] C04B 35/18, 38/10, 41/53, 41/91
U.S. Cl. 501—84 7 Claims

1. Kiln furniture for supporting ceramic ware during the firing thereof, comprised of a porous, low-density, refractory ceramic body having on one or more surfaces thereof an integral smooth skin in the form of a thin porous ceramic membrane layer, the pores of which are of an average size smaller than those of said body portion and remaining surfaces, said ceramic body being formed from the firing of a porous molded aluminosilicate-bound aggregate of refractory ceramic materials which has been treated prior to firing to reduce the alkali metal content thereof.

4,812,425

PURIFYING REFRACTORY METAL BORIDES

Joseph K. Walker, Jr., Beachwood, Ohio, assignor to ELTECH Systems Corporation, Boca Raton, Fla.

Continuation-in-part of Ser. No. 871,445, Jun. 6, 1986, abandoned. This application Jan. 26, 1988, Ser. No. 148,462
Int. Cl.[4] C01B 35/04; C04B 35/02
U.S. Cl. 501—96 18 Claims

1. The method of producing a consolidated body containing purified titanium diboride, from an impure particulate refractory titanium diboride containing oxygen and boron carbide impurities and having total oxygen content of about 2% or less, by weight of said diboride, but with the proviso that said oxygen content can exceed said 2 weight percent when the total of all the carbon impurity for said diboride is greater than about 0.75 percent by weight of the diboride, which method comprises:

(a) admixing impure particulate titanium diboride containing said boron carbide impurity with material consisting essentially of boron oxide to bring the O:C molar ratio to at least 2:1 while maintaining the total oxygen content in accordance with the conditions as stated hereinabove;

(b) heating the admixture at a temperature substantially below the sintering temperature of the titanium diboride and substantially below a temperature favoring oxide formation of the titanium metal, but sufficiently elevated to oxidize said boron carbide impurity, at a reduced pressure and for a time sufficient to substantially reduce said boron carbide impurity; and

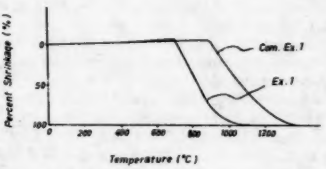
(c) heating the admixture to the sintering temperature of the titanium diboride at a reduced pressure and for a time sufficient to further reduce the boron carbide, as well as to reduce the oxygen, impurity content of the step (b) and to provide a consolidated body containing the purified titanium diboride.

4,812,426

LEAD-CONTAINING OXIDE POWDER

Touichi Takagi, Tokyo; Kohei Ametani, Kanagawa, and Kouichi Shimizu, Niigata, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 762,610, Aug. 5, 1985, abandoned. This application Feb. 6, 1987, Ser. No. 12,103
Claims priority, application Japan, Aug. 21, 1984, 59-172425; Dec. 29, 1984, 59-278754; Feb. 12, 1986, 61-26746; Feb. 19, 1986, 61-34112
Int. Cl.[4] C03C 35//46
U.S. Cl. 501—136 30 Claims



1. A process for preparing a powder of lead-containing oxides for the production of an element comprising the steps of:

(a) mixing and calcining a powder of a material selected from the group consisting of titanium oxide, lead-containing titanium oxide, metal substances forming said titanium oxide upon calcination and mixtures thereof with or without a powder of a material selected from the group consisting of oxides of metals other than lead, lead-containing metal oxides,metal substances forming said oxides upon calcination and mixtures thereof, the metal constituting said oxides of metals other than lead being selected from the group consisting of zirconium (Zr), lithium (Li), copper (Cu), magnesium (Mg), nickel (Ni), barium (Ba), calcium (Ca), strontium (Sr), zinc (Zn), manganese (Mn), cobalt (Co), tin (Sn), iron (Fe), cadmium (Cd), antimony (Sb), aluminum (Al), rare earth metals, indium (In), selenium (Se), niobium (Nb), tantalum (Ta), bismuth (Bi), tungsten (W), tellurium (Te), rhenium (Re) and mixtures thereof, said metal substances forming said oxides upon calcination being selected from the group consisting of elemental metals, metal carbonates, metal oxalates, metal formates, metal hydroxides and basic metal carbonates;

(b) adding and mixing a powder of a lead substance to obtain a mixture, said lead substance being selected from the group consisting of PbO, Pb_3O_4, PbO_2, Pb, $(PbCO_3)_2$·Pb$(OH)_2$, $PbCO_3$, $Pb(CH_3COO)_4$, $Pb(CH_3COO)_2$·Pb$(OH)_2$ and mixtures thereof; and

(c) calcining said mixture at a temperature of from 400° C. to 1200° C.

4,812,427

CLAY SLURRY

William Kohut, Springville, Tenn., assignor to H. C. Spinks Clay Company Inc., Paris, Tenn.

Continuation-in-part of Ser. No. 895,815, Aug. 12, 1986, abandoned. This application Sep. 22, 1987, Ser. No. 99,917
Int. Cl.[4] C04B 33/28
U.S. Cl. 501—148 10 Claims

1. A blended, stable ball clay/water slurry, wherein:

(a) said slurry is comprised of from about 58 to about 68 percent (by total weight) of slurry of ball clay (dry basis) and from about 42 to about 32 percent (by total weight of slurry) of water;

(b) said slurry has an initial Brookfield 100 rpm viscosity of from about 100 to about 600 centipoise;

(c) from about 30 to about 45 percent (by weight of dry ball clay) of the particles in said ball clay slurry are smaller than 0.5 microns, from about 53 to about 69 percent of the

ball clay slurry particles are smaller than 2 microns, and from about 70 to about 85 percent of the ball clay slurry particles are smaller than 5 microns;

(d) said ball clay slurry has a specific surface area of from about 16 to about 21 square meters per gram;

(e) said slurry, when freshly made, has a five-minute gel viscosity at 0.5 revolutions per minute of from about 1,000 to about 10,000 centipoise;

(f) said slurry, when freshly made, has a ten-minute gel viscosity of from about 2,200 to about 12,000 centipoise;

(g) said slurry, when freshly made, has a twenty-minute gel viscosity of from about 3,500 to about 14,000 centipoise;

(h) the difference between the twenty-minute gel viscosity of the slurry and its ten-minute gel viscosity is less than about 3,000 centipoise;

(i) the difference between the twenty-minute gel viscosity of the slurry and its five-minute gel viscosity is less than about 4,000 centipoise;

(j) the twenty-minute gel viscosity of a three-day old sample of said ball clay slurry is no more than 50 percent greater than the twenty-minute gel viscosity of the freshly-made slurry and is from about 3,500 to about 14,000 centipoise;

(k) said ball clay slurry contains from about 0.01 to about 1.0 percent of organic polyelectrolyte (weight of active ingredient, by weight of dry ball clay) wherein said organic polyelectrolyte has a molecular weight of from about 1,400 to about 6,000;

(l) said ball clay slurry contains from about 50 to about 650 parts per million (by weight of dry ball clay) of soluble sulfate ion;

(m) said slurry has a settling index of at least about 0.9;

(n) said slurry has a flow index of from about 20 to about 30 seconds;

(o) said slurry has a casting rate of from about 30 to about 60 grams after one hour;

(p) said slurry has a transmission of at least about 60 percent;

(q) said slurry has a dry modulus of from about 550 to about 700 pounds per square inch;

(r) said ball clay slurry contains from about 50 to about 65 percent (by weight of dry ball clay) of silica and from about 20 to about 35 percent of alumina; and

(s) the silica/alumina weight ratio in said ball clay slurry is from about 2.0 to about 3.0.

4,812,428

PROCESS FOR PREPARING A CLAY SLURRY

William Kohut, Springville, Tenn., assignor to H. C. Spinks Clay Company Inc., Paris, Tenn.

Continuation-in-part of Ser. No. 919,386, Oct. 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 895,815, Aug. 12, 1986, abandoned. This application Sep. 22, 1987, Ser. No. 99,916

Int. Cl.[4] C04B *33/28*

U.S. Cl. 501—148 **10 Claims**

1. A process for preparing a stable ball clay slurry, comprising the steps of providing at least two ball clay/water mixtures, each of which is comprised of a different ball clay, and blending said ball clay/water mixtures in proportions sufficient to produce a stable ball clay slurry, wherein each of said ball clay mixtures is produced by a process comprised of the steps of sequentially mixing ball clay with water, adding organic polyelectrolyte to the mixture of ball clay and water, and blunging the mixture of ball clay, water, and organic polyelectrolyte; and wherein said ball clay mixtures are blended in proportions sufficient to produce a slurry wherein:

(a) said slurry is comprised of from about 58 to about 68 percent (by total weight) of slurry of ball clay (dry basis) and from about 42 to about 32 percent (by total weight of slurry) of water;

(b) said slurry has an initial Brookfield 100 rpm viscosity of from about 100 to about 600 centipoise;

(c) from about 30 to about 45 percent (by weight of dry ball clay) of the particles in said ball clay slurry are smaller than 0.5 microns, from about 53 to about 69 percent of the ball clay slurry particles are smaller than 2 microns, and from about 70 to about 85 percent of the ball clay slurry particles are smaller than 5 microns;

(d) said ball clay slurry has a specific surface area of from about 16 to about 21 square meters per gram;

(e) said slurry, when freshly made, has a five-minute gel viscosity at 0.5 revolutions per minute of from about 1,000 to about 10,000 centipoise;

(f) said slurry, when freshly made, has a ten-minute gel viscosity of from about 2,200 to about 12,000 centipoise;

(g) said slurry, when freshly made, has a twenty-minute gel viscosity of from about 3,500 to about 14,000 centipoise;

(h) the difference between the twenty-minute gel viscosity of the slurry and its ten-minute gel viscosity is less than about 3,000 centipoise;

(i) the difference between the twenty-minute gel viscosity of the slurry and its five-minute gel viscosity is less than about 4,000 centipoise;

(j) the twenty-minute gel viscosity of a threee-day old sample of said ball clay slurry is no more than 50 percent greater than the twenty-minute gel viscosity of the freshly-made slurry and is from about 3,500 to about 14,000 centipoise;

(k) said ball clay slurry contains from about 0.01 to about 1.0 percent of organic polyelectrolyte (weight of active ingredient, by weight of dry ball clay)wherein said organic polyelectrolyte has a molecular weight of from about 1,400 to about 6,000;

(l) said ball clay slurry contains from about 50 to about 650 parts per million (by weight of dry ball clay) of soluble sulfate ion;

(m) said slurry has a settling index of at least about 0.9;

(n) said slurry has a flow index of from about 20 to about 30 seconds;

(o) said slurry has a casting rate of from about 30 to about 60 grams after one hour;

(p) said slurry has a transmission of at least about 60 percent;

(q) said slurry has a dry modulus of from about 550 to about 700 pounds per square inch;

(r) said ball clay slurry contains from about 50 to about 65 percent (by weight of dry ball clay) of silica and from about 20 to about 35 percent of alumina; and

(s) the silica/alumina weight ratio in said ball clay slurry is from about 2.0 to about 3.0.

4,812,429

METHOD FOR CLEANING WASTE GAS DENITRATING CATALYST

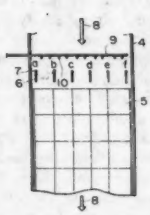
Mitsuyasu Honda; Touru Seto, and Shigeaki Mitsuoka, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha

Filed Nov. 24, 1987, Ser. No. 124,667

Claims priority, application Japan, Dec. 4, 1986, 61-287694

Int. Cl.[4] B01J *38/04, 38/00, 23/92;* **B01D** *53/36*

U.S. Cl. 502—34 **5 Claims**



1. A method for cleaning a waste gas denitrating catalyst which is characterized by comprising the steps of disposing a plurality of gas rectifying paltes at regular intervals above an

upright arrangement of denitrating catalyst layers, said gas rectifying plates being parallel to each other and each of them being supported by a rotational axis attached to it in its longitudinal direction, rotatively moving said rectifying plates so as to form a V-shape between said adjacent rectifying plates, collecting dust present in said waste gas by said V-shaped rectifying plates, causing the thus collected dust to fall into gas passage inlets of denitrating catalyst layers successively in order to thereby remove said dust deposited on the surfaces and the edge faces of said catalyst layers thereform, and repeating the above operation to forcedly wear and remove catalyst poisons deposited on and in said catalyst layers by the falling dust.

4,812,430

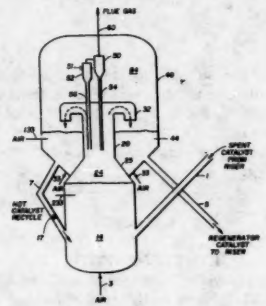
NO_x CONTROL DURING MULTISTAGE COMBUSTION

Jonathan E. Child, Sewell, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 12, 1987, Ser. No. 84,242

Int. Cl.[4] B01J *38/36, 29/38;* C10G *11/18;* C01B *21/20*

U.S. Cl. 502—42 **12 Claims**



1. In a Fluidized Catalytic Cracking (FCC) process wherein conventional FCC catalyst contacts conventional FCC feedstocks in a conventional FCC reactor to produce cracked products and coked catalyst which is regenerated in a conventional regenerator comprising a first dense bed coke combustor to which air or an oxygen-containing gas is added to produce at least partially regenerated catalyst and combustion gas which rise from the first dense bed and through a dilute phase transport riser to form a second dense bed of regenerated catalyst and flue gas, and the regenerated catalyst is recycled to the FCC reactor, the improvement comprising reducing NO_x emissions and achieving substantially complete carbon monoxide combustion by selective addition of a carbon monoxide (CO) combustion promoter to the dilute phase transport riser, such that there is a greater concentration of said combustion promoter in the dilute phase transport riser than in the first dense bed and wherein after passing through said dilute phase transport riser combustion promoter is recycled to said dilute phase transport riser.

4,812,431

NOX CONTROL IN FLUIDIZED BED COMBUSTION

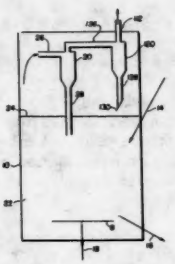
Jonathan E. Child, Sewell, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 12, 1987, Ser. No. 84,243

Int. Cl.[4] B01J *38/36;* R01J *29/38;* C10G *11/18;* C01B *21/20*

U.S. Cl. 502—42 **3 Claims**

1. In a fluidized catalytic cracking (FCC) process wherein conventional FCC catalyst contacts conventional FCC feedstock in a conventional FCC reactor to produce cracked products and coked catalyst which is regenerated in a conventional FCC regenerator comprising a single dense bed to which air or an oxygen-containing gas is added to produce a regenerated catalyst and flue gas containing CO_2 and NO_x resulting from coke combustion, and wherein carbon monoxide (CO) combustion promoter is uniformly distributed in the catalyst bed to promote complete combustion of CO to CO_2, the improvement comprising maintaining a majority of the CO combustion promoter as a solid particle with a volume at least 10 times greater than the conventional FCC catalyst and having a low



density, relative to the dense bed density, so that the promoter floats to the top of the regenerator dense bed of FCC catalyst in the FCC regenerator, and maintaining a reducing atmosphere in a lower one-half portion of the dense bed of FCC catalyst in the FCC regenerator and converting in the reducing atmosphere at least a portion of the NO_x formed during coke combustion to nitrogen.

4,812,432

ETHYLENE POLYMERIZATION CATALYST

Mary T. Zoeckler, Frenchtown, and Frederick J. Karol, Belle Mead, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 032,359, Mar. 31, 1987. This application Nov. 23, 1987, Ser. No. 124,264

Int. Cl.[4] C08F *4/64, 10/02*

U.S. Cl. 502—112 **12 Claims**

1. A vanadium catalyst composition comprising:

(i) the reaction product of a vanadium trihalide wherein the halogen is chlorine, bromine, or iodine, or mixtures thereof, and an electron donor, which is a liquid organic Lewis base in which the vanadium trihalide is soluble;

(ii) a modifier, BX_3 or a compound having the formula $AlR_{(3-a)}X_a$ wherein each R is an alkyl radical having 1 to 14 carbon atoms and is alike or different; X is chlorine, bromine, or iodine, or mixtures thereof; and a is 0, 1, or 2;

(iii) a silica support into which components (i) and (ii) are impregnated;

(iv) a salt admixed with the silica support, the cation of said salt being selected from Groups I and II of the Periodic Chart of the Atoms and the anion of said salt being a carbonate or a sulfate;

(v) a halocarbon promoter; and

(vi) a hydrocarbyl aluminum cocatalyst, wherein the molar ratio of (a) electron donor to vanadium trihalide is about 1:1 to about 20:1; (b) modifier to electron donor is about 0.1:1 to about 10:1; (c) cocatalyst to component (i) is about 5:1 to 500:1; (d) promoter to cocatalyst is about 0.1:1 to about 10:1.

4,812,433

PROCESS FOR THE PRODUCTION OF METHANOL AND A COMPOSITION SUITABLE FOR USE AS A CATALYST IN SAID PROCESS

Swan T. Sie; Eit Drent, and Willem W. Jager, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 30, 1988, Ser. No. 175,026

Claims priority, application United Kingdom, Apr. 3, 1987, 8708005

Int. Cl.[4] B01J *31/04, 31/12, 31/28*

U.S. Cl. 502—117 15 Claims

1. A composition prepared by combining the following components:

Component (a): a nickel salt,

Component (b): a hydride selected from the group consisting of a hydride of an alkali metal, a hydride of an alkaline earth metal, and a mixture thereof, and

component (c): an ester of formic acid which originates from an external source.

4,812,434

EXHAUST GAS CATALYSTS AND PROCESS FOR THE PRODUCTION THEREOF

Hans-Jürgen Pohlmann, and Klaus Strobel, both of Selb, Fed. Rep. of Germany, assignors to Hutschenreuther AG, Selb, Fed. Rep. of Germany

Continuation of Ser. No. 767,859, Aug. 21, 1985, abandoned. This application Mar. 9, 1988, Ser. No. 169,107

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1984, 3430912

Int. Cl.[4] B01J *27/224*

U.S. Cl. 502—178 12 Claims

1. An exhaust gas catalyst, consisting of about 50 to about 95% by weight of silicon carbide having a grain size distribution of up to about 100 μm and about 5 to about 50% by weight of an alloy of silicon with one or more metals of the group consisting of copper, iron, cobalt, nickel, chromium, vanadium, molybdenum, manganese, zinc, silver, platinum and palladium whereby this or these metals are distributed homogeneously over the whole cross-section of the catalyst.

4,812,435

POLYMETALLIC REFORMING CATALYSTS AND THEIR PREPARATION

William C. Baird, Jr., Baton Rouge, La., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 2,157, Jan. 12, 1987, Pat. No. 4,746,418. This application Feb. 19, 1988, Ser. No. 157,605

Int. Cl.[4] B01J *21/04, 27/13, 27/132, 27/135*

U.S. Cl. 502—227 17 Claims

1. A catalyst useful for reforming a naphtha feed at reforming conditions comprising an iridium component in concentration ranging from about 0.001 percent to about 2 percent dispersed throughout, and bound within an alumina support matrix by calcining the iridium-alumina composite at temperature ranging from about 370° C. to about 700° c. for a period ranging from about 1 hour to about 72 hours, a platinum component in concentration ranging from about 0.001 percent to about 2 percent dispersed upon said iridium-containing alumina support, and a halogen component dispersed thereon in concentration ranging from about 0.01 percent to about 2 percent, based on the total weight of the catalyst, said iridium component being dispersed throughout and bound within said alumina support even when the composition is subjected to temperatures ranging above about 426.7° C. at oxygen concentrations ranging above about 0.1 percent, based on the volume of the gas contacted with the catalyst, for periods ranging from about 1 hour to about 48 hours.

4,812,436

METAL-OXIDE-SILICA ADSORBENT FOR BLEACHING AND REFINING OIL

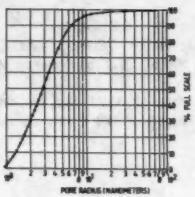
Leendert H. Staal, Parkgate, Great Britain; Jan C. Vis, and Jan W. Groeneweg, both of Leyden, Netherlands, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands

Filed Nov. 24, 1987, Ser. No. 124,864

Claims priority, application United Kingdom, Nov. 24, 1986, 8628067; European Pat. Off., Jan. 16, 1987, 87200057.5

Int. Cl.[4] B01J *20/10, 20/28;* C11B *3/10*

U.S. Cl. 502—407 14 Claims



1. An adsorbent suitable for bleaching-refining fatty oil which essentially consists of a synthetic calcined metal-oxide-silica, having a surface area, at least 40% whereof is contained in pores with a radius of 2–4 nm, and having a specific pore volume in pores with a radius in the range of 100–2000 nm of at least 0.5 ml/g.

4,812,437

SILVER-DEPOSITED CATALYST FOR PRODUCTION OF ETHYLENE OXIDE

Naohiro Nojiri, Tsuchiura; Yukio Sakai, and Tomoatsu Iwakura, both of Ami, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed May 5, 1987, Ser. No. 46,177

Claims priority, application Japan, May 9, 1986, 61-104950

Int. Cl.[4] B01J *21/12, 23/02, 23/04, 23/50*

U.S. Cl. 502—243 12 Claims

1. A silver-deposited catalyst for production of ethylene oxide by oxidizing ethylene, said catalyst comprising as catalyst ingredients silver and a cation component selected at least from sodium, potassium, rubidium and cesium, and a carrier composed mainly of alpha-alumina, said carrier having:

(1) a surface area of 0.8 to $2m^2/g$,

(2) acidity that can be detected by an indicator having a pKa of +4.8,

(3) a water absorption of 20 to 50%,

(4) a silica content of 0.5 to 12% by weight,

(5) a silica cointent, per m^2/g of surface area, of 0.5 to 12 % by weight,

(6) a sodium content of 0.08 to 2% by weight, and

(7) a crystal of $Al_6Si_2O_{13}$ which can be detected by X-ray diffraction analysis.

4,812,438

HEAT-SENSITIVE RECORDING MATERIAL

Tsunefumi Yamori; Shigekazu Shuku, and Hironari Fujioka, all of Hyogo, Japan, assignors to Kanzaki Paper Mfg. Co., Ltd., Tokyo, Japan

Filed May 20, 1987, Ser. No. 51,599

Claims priority, application Japan, May 29, 1986, 61-124562

Int. Cl.[4] B41M *5/18*

U.S. Cl. 503—200 6 Claims

1. A heat-sensitive recording material comprising a support; a heat-sensitive recording layer formed on said support, which contains a color former and a color developer which forms a color upon contact with said color former; an interlayer with a Bekk smoothness as defined by TAPPI Standard T479 om-81

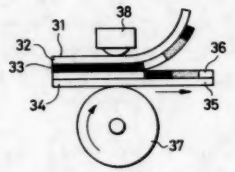
of from 50 to 1500 seconds formed on said heat-sensitive recording layer, which contains a water-soluble resin; and an overcoat formed on said interlayer, said overcoat layer comprising a resin which has been cured by exposure to electron beams.

4,812,439

COLOR INK SHEET FOR THERMAL TRANSFER

Shuichi Ohara; Sinichi Akasaka; Hiroyuki Oka, and Shintaroo Hattori, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 30, 1986, Ser. No. 890,608
Claims priority, application Japan, Aug. 5, 1985, 60-171079
Int. Cl.[4] B41M 5/035, 5/26
U.S. Cl. 503—227 12 Claims



1. A color ink sheet for thermal transfer comprising thermal transfer ink layers containing at least three colorants comprising a yellow colorant, a magenta colorant and a cyan colorant provided on a base sheet, the yellow, magenta and cyan colorants comprising sublimination dyes, characterized in that when the reflection density of the colorants is 1.3 after the transfer onto a recording paper, a spectral reflectance y (%) of the yellow colorant lies in between two diagrams represented by the following formulae (1) and (2), a spectral reflectance y (%) of the magenta colorant lies in between two diagrams represented by the following formulae (3) and (4), and a spectral reflectance y (%) of the cyan colorant lies in between two diagrams represented by the following formulae (5) and (6):

$$(1)\begin{cases} y = -\frac{2}{3}(x - 400) + 30 & \dots 400 \leqq x \leqq 430 \\ y = 10 & \dots 430 \leqq x \leqq 440 \\ y = \frac{17}{12}(x - 440) + 10 & \dots 440 \leqq x \leqq 500 \\ y = 95 & \dots 500 \leqq x \leqq 700 \end{cases}$$

$$(2)\begin{cases} y = 5 & \dots 430 \leqq x \leqq 490 \\ y = 2(x - 490) + 5 & \dots 490 \leqq x \leqq 530 \\ y = 85 & \dots 530 \leqq x \leqq 700 \end{cases}$$

$$(3)\begin{cases} y = -\frac{5}{12}(x - 400) + 80 & \dots 400 \leqq x \leqq 460 \\ y = -\frac{9}{10}(x - 510) + 10 & \dots 460 \leqq x \leqq 510 \\ y = 10 & \dots 510 \leqq x \leqq 560 \\ y = \frac{17}{4}(x - 560) + 10 & \dots 560 \leqq x \leqq 580 \\ y = 95 & \dots 580 \leqq x \leqq 700 \end{cases}$$

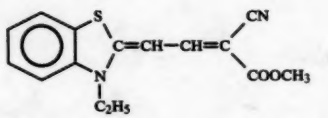
-continued

$$(4)\begin{cases} y = \frac{3}{8}(x - 400) + 20 & \dots 400 \leqq x \leqq 440 \\ y = -\frac{3}{4}(x - 480) + 5 & \dots 440 \leqq x \leqq 480 \\ y = 5 & \dots 480 \leqq x \leqq 600 \\ y = \frac{8}{5}(x - 600) + 5 & \dots 600 \leqq x \leqq 650 \\ y = 85 & \dots 650 \leqq x \leqq 700 \end{cases}$$

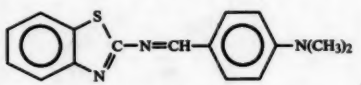
$$(5)\begin{cases} y = \frac{1}{2}(x - 400) + 60 & \dots 400 \leqq x \leqq 450 \\ y = 85 & \dots 450 \leqq x \leqq 470 \\ y = -\frac{1}{2}(x - 620) + 10 & \dots 470 \leqq x \leqq 620 \\ y = 10 & \dots 620 \leqq x \leqq 660 \\ y = \frac{11}{8}(x - 660) + 10 & \dots 660 \leqq x \leqq 700 \end{cases}$$

$$(6)\begin{cases} y = \frac{2}{3}(x - 400) + 20 & \dots 400 \leqq x \leqq 460 \\ y = -\frac{11}{20}(x - 560) + 5 & \dots 460 \leqq x \leqq 560 \\ y = 5 & \dots 560 \leqq x \leqq 700 \end{cases}$$

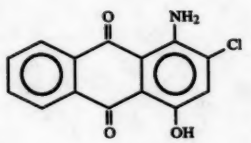
wherein x represents a light wavelength (nm), and wherein said yellow colorant comprises a material selected from the group consisting of



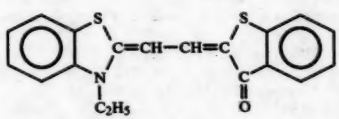
and



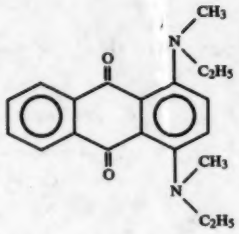
said magenta colorant comprises a material selected from the group consisting of

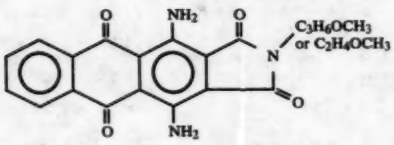


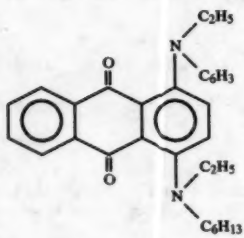
and



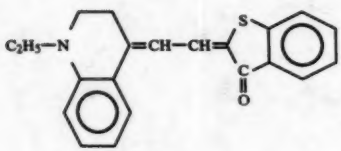
and said cyan colorant comprises a material selected from the group consisting of

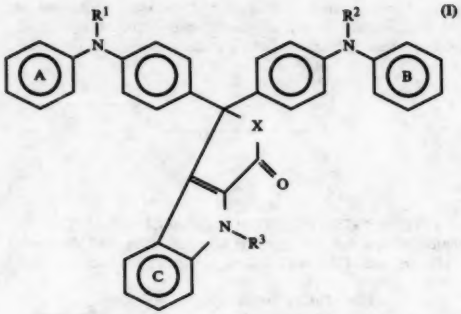






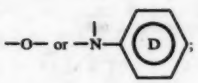
and





(I)

in which each of R^1 and R^2 independently is a monovalent group selected from the group consisting of an alkyl group, an aralkyl group and an aryl group; R^3 is an alkyl group or an aralkyl group; X is



and each of R^1, R^2, R^3, X and the benzene rings A, B, C and D may have one or more substituent groups.

4,812,440

RECORDING MATERIAL CONTAINING LEUCO DYE

Toru Harada, Kanagawa, and Ken Iwakura, Shizuoka, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 30, 1987, Ser. No. 114,972
Claims priority, application Japan, Oct. 30, 1986, 61-259966
Int. Cl.[4] B41M *5/16, 5/18, 5/22*
U.S. Cl. 503—223 **8 Claims**

1. A recording material comprising a layer containing a leuco dye provided on a support, wherein the leuco dye has the formula (I):

4,812,441

HYPOCHOLESTEROLEMICALLY ACTIVE PROTEIN DERIVED FROM STREPTOCOCCUS

Yasuo Kawai, Atsugi, and Kazunaga Yazawa, Sagamihara, both of Japan, assignors to Kabushiki Kaisya Advance Kaihatsu Kenkyujo, Tokyo, Japan

Continuation of Ser. No. 563,403, Dec. 20, 1983, abandoned.
This application Feb. 7, 1986, Ser. No. 827,500
Claims priority, application Japan, Dec. 28, 1982, 57-227395
Int. Cl.[4] A61K *37/02, 35/74;* **C12P** *21/00;* **C12R** *1/46*
U.S. Cl. 514—2 **9 Claims**

1. A hypocholesterolemically active protein wherein said protein is derived from a microoganism belonging to the genus *Streptococcus* and has the following characteristics:

(a) Molecular weighyt by gel filtration: 30,000±7,000

(b) Isoelectric point: 7.9±0.2

(c) Amino acid composition (mole %):

Glycine	25.23	Alanine	10.98
Glutamate	10.34	Asparaginate	8.20
Lysine	6.39	Leucine	5.58
Valine	5.41	Isoleucine	5.18
Threonine	4.23	Tyrosine	4.19
Serine	3.46	Proline	2.62
Arginine	2.60	Phenylalanine	2.51
Methionine	1.56	Histidine	1.30
Cysteine	0.16		

(d) Pattern of electrophoresis: a sharp band on the anode side on polyacrylamide gel electrophoresis

(e) Physiological characteristics: having a hypocholesterolemic activity when orally administered to mamuals.

4,812,442

TRIPEPTIDE RENIN INHIBITORS

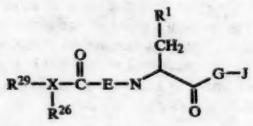
Joshua S. Boger, Westfield, N.J.; Ben E. Evans, Landsdale, and Mark G. Bock, Hatfield, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 886,487, Jul. 16, 1986, which is a continuation-in-part of Ser. No. 758,625, Jul. 24, 1985, abandoned, which is a continuation-in-part of Ser. No. 614,881, May 29, 1984, abandoned. This application May 4, 1987, Ser. No. 45,941

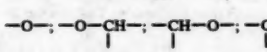
Int. Cl.[4] A61K *34/43*; C07K *5/06, 5/08*; C07D *241/04, 265/30, 211/30, 211/70, 263/02, 233/54, 207/04*

U.S. Cl. 514—18 8 Claims

1. A compound of the formula:

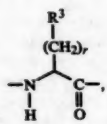


wherein X is



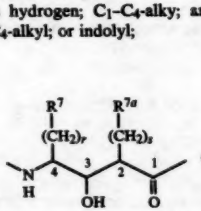
R^1 is hydrogen, C_1–C_4-alkyl, hydroxy-C_1–C_4-alkyl, aryl, as defined below, indolyl, 4-imidazolyl, amino-C_2–C_4-alkyl, Guanidyl-C_2–C_3-alkyl or methylthiomethyl; R^{29} and R^{26} are independently hydrogen, or W-(CH_2)n in which W is hydrogen, C_1–C_4-alkyl, aryl, wherein aryl is unsubstituted or mono-, di or trisubstituted phenyl or naphthyl where each substituent is independently selected from the group consisting of C_1–C_8-alkyl, amino, mono-or di-C_1–C_4-alkylamino, amino-C_1–C_4-alkyl, hydroxy-C_1–C_4-aklyl, mono- or di-C_1–C_4-aklylamino-C_1–C_4-alkyl, guanidyl, guanidyl-C_1–C_4-alkoxy, CF_3, halo, CO_2H, CO_2-C_1–C_4-alkyl, CO_2-C_1–C_4- alkoxy, NR^5R^6, and $N(R^5)_{+3}A^-$,

wherein R^5 and R^6 are independently hydrogen, unsubstituted C_1–C_4-alkyl, and A^- is an anion, and n is 0 to 5; except that when X is —O— only one of R^{29} or R^{26} is present; E is absent; or

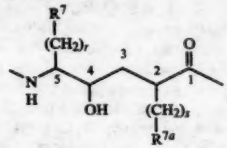


where r is 1 to 4; and

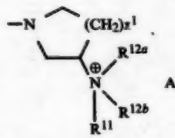
R^3 is hydrogen; C_1–C_4-alky; aryl, as defined above; aryl-C_1–C_4-alkyl; or indolyl;

G is  or

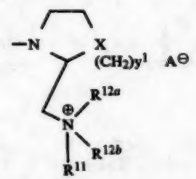
-continued



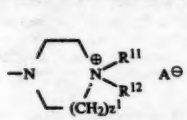
wherein R^7 is C_3–C_6-alkyl; aryl, as defined above; or unsubstituted or mono-, di- or trisubstituted C_3–C_7-cycloalkyl, wherein each substituent is independently selected from the group consisting of C_1–C_4-alkyl, trifluoromethyl, hydroxy, C_1–C_4-alkoxy, and halo; and s is 0 to 4; R^{7a} is hydrogen; C_1–C_8-alkyl; C_2–C_8-alkenyl; mono or disubstituted C_2–C_8-alkyl, wherein the substituent (s) is/are on the final 1 and/or 2 carbon atoms of the alkyl chain and is/are independently selected from the group consisting of hydroxy aryl, as defined above; unsubstituted or mono-, di- or trisubstituted C_3–C_7-cycloalkyl, wherein each substituent is independently selected from the group consisting of C_1–C_4-alkyl, trifluoromethyl, hydroxy, C_1–C_4-alkoxy, and halo; R^7, X^1 and r are as defined above; and wherein the first alternate G definition of the above formula has a 2S or 2R, 3S, 4S configuration; and J is Y-(CH_2)x [$CH(R^5)$]y-(CH_2)z-R^{10} wherein Y is oxygen, NH, or N-C_1–C_4-alkyl, x and y are independently zero, 1, 2, or 3 and z is zero or one; R^{10} is a quarternized 5 to 7 membered heterocyclic ring containing N^+A^-; quaternized ring containing one additional heteroatom selected from N, NO, O, S, SO or SO_2; a quaternized ring as defined containing a substituent on the ring carbon in which the substituent on the ring carbon in which the substituent is selected from —OH, —CO_2H, —SO_3H, —SO_2NH_2, -aryl as defined above, —CF_3, —halo, or unsubstituted mono, or di-C_1–C_4-alkylamino; a quaternized ring as defined in which the nitrogen is substituted by R^{11} and R^{12} as defined below; or the quaternized nitrogen is fused with a second ring having 4 to 6 carbon atoms forming a spiro-fused ring system, or fused with a —$(CH_2)_2$—O—$(CH_2)_2$— substituent;



in which xl is 1, 2 or 3;



in which Y^1 is zero or 1 and X is absent, oxygen or NH;



in which Z^1 is 1 or 2, A^- is an anion, and R^{12a} and R^{12b} have the same significance as R^{12}; R^{11} is C_1–C_4 alkyl, substituted

C_1–C_4 alkyl in which the substituent is —OH, —CO_2H, —SO_3H, —SO_2NH_2, -aryl as defined above, -halo, unsubstituted, mono or di-C_1–C_4 alkylamino-; a non-quaternized 5 or 6 membered heterocyclic ring containing a nitrogen and an additional heteroatom selected from N, NO, O, S, SO_2 or SO_2, or a 5 or 6 memebered heterocyclic ring containing one nitrogen and one additional heteroatom as defined and substituted with one or two C_1–C_4 alkyl; R^{12} is C_1–C_4 alkyl; and, -$NR^{11}R^{12a}R^{12b}$+A− in which R^{11} is as defined above and R^{12a} and R^{12b} independently have the same significance as R^{12} and A− is as defined above.

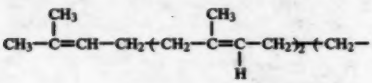
4,812,443

METHODS FOR ENHANCING DIFFERENTIATION AND PROLIFERATION OF HEMATOPOIETIC PROGENITOR CELLS

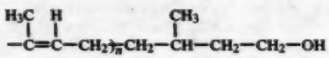
Fumimaro Takaki; Akio Urabe, both of Tokyo; Michiya Shimamura, Funabashi, and Masao Mizuno, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Okayama, Japan

Filed Jun. 24, 1985, Ser. No. 748,403
Claims priority, application Japan, Jun. 29, 1984, 59-132945
Int. Cl.[4] A61K *31/66*
U.S. Cl. 514—143 **8 Claims**

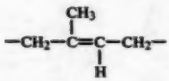
1. A method for enhancing differentiation and proliferation of hematopoietic progenitor cells in a mammal, which comprises administering to the mammal an effective amount of a compound of the formula



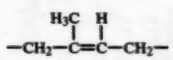
(I)



wherein



is a trans-isoprene unit,



is a cis-isoprene unit, and n is an integer of from 12 to 18, or a pharmaceutically acceptable ester thereof.

4,812,444

DEHYDRATION OF HYDROUS MATTER USING ANHYDROUS GLYCOSYLFRUCTOSE

Masakazu Mitsuhashi; Shuzo Sakai, and Toshio Miyake, all of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Filed Dec. 16, 1986, Ser. No. 942,421
Claims priority, application Japan, Dec. 26, 1985, 60-292297
Int. Cl.[4] A61K *47/00*; C08L *5/00*
U.S. Cl. 514—53 **8 Claims**

1. A method for dehydrating a hydrous product, comprising incorporating an anhydrous glycosylfructose into the hydrous product to convert said anhydrous glycosylfructose into crystalline glycosylfructose hydrate.

4,812,445

STARCH BASED ENCAPSULATION PROCESS

James Eden, East Millstone; Ralph Trksak, Manville, both of N.J., and Robert Williams, Homosassa, Fla., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 11,952, Feb. 6, 1987, abandoned. This application Apr. 23, 1987, Ser. No. 41,563
Int. Cl.[4] A23L *1/22, 1/226*; A61K *9/26*; A01N *25/28*
U.S. Cl. 514—60 **19 Claims**

1. A process for encapsulation of materials in a starch matrix comprising the steps of:

(1) slurrying the starch in water;

(2) thoroughly dispersing the starch in the slurry by injecting steam at a pressure of at least 110 psi into the slurry to raise its temperature to 120° to 180° C. at a pressure of 55–120 psi or above;

(3) adding to the dispersion the material to be encapsulated and effecting intimate mixing of the latter therein;

(4) spreading the resultant mixture on a chilled surface;

(5) recovering the encapsulated material in sheet form; and

(6) cutting or grinding and drying the resultant matrix of starch and encapsulated material.

4,812,446

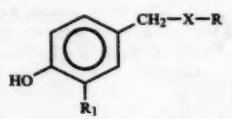
PHARMACEUTICAL PRODUCTS PROVIDING ENHANCED ANALGESIA

Larry M. Brand, West Chester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

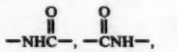
Division of Ser. No. 684,642, Dec. 24, 1984, Pat. No. 4,681,897. This application Jul. 17, 1987, Ser. No. 74,655
Int. Cl.[4] A61K *31/60, 31/13, 31/16*
U.S. Cl. 514—165 **17 Claims**

1. An analgesic composition comprising a safe and effective amount of:

(a) a capsaicinoid analgesic compound of the general formula:



wherein R_1 is selected from the group consisting of OH and OCH_3, X is selected from the group consisting of



and R is a C_{16}–C_{21} cis-mono-unsaturated alkenyl;

(b) a nonsteroidal analgesic selected from the group consisting of salicylates, salicylate-like analgesic-antipyretics, and the pharmaceutically acceptable salts thereof; and

(c) a pharmaceutically-acceptable carrier; wherein the weight ratio of (a):(b) is from about 20:1 to about 1:20.

4,812,447

METHOD FOR THE TREATMENT OF NERVOUS SYSTEM DEGENERATION

Eugene Roberts, Monrovia, Calif., assignor to City of Hope, Duarte, Calif.

Continuation of Ser. No. 790,080, Oct. 22, 1985, abandoned. This application Dec. 11, 1986, Ser. No. 940,789
Int. Cl.[4] A61K *31/55, 31/56*
U.S. Cl. 514—170 **6 Claims**

1. A method for facilitating the growth of brain cells, comprising the step of administering dehydroepiandrosterone or dehydroepiandroesterone sulfate to said brain cells.

4,812,448

METHOD FOR THE PREVENTION OF OCULAR HYPERTENSION, TREATMENT OF GLAUCOMA AND TREATMENT OF OCULAR HYPERTENSION

Paul A. Knepper, 175 E. Delaware St., Chicago, Ill. 60611

Continuation-in-part of Ser. No. 663,507, Oct. 22, 1984, Pat. No. 4,617,299, which is a continuation-in-part of Ser. No. 562,843, Dec. 19, 1983, abandoned. This application Oct. 14, 1986, Ser. No. 918,480

Int. Cl.[4] A61K *31/595*

U.S. Cl. 514—178 9 Claims

1. A method for reducing elevated intraocular pressure in an eye of a warm blooded animal which comprises contacting the affected eye with an intraocular pressure reducing amount of 17-alpha-methyl-testosterone 1 to about 6 times per day for a time period of at least about three days.

4,812,449

IN SITU ACTIVE COMPOUND ASSEMBLY

Darryl C. Rideout, Del Mar, Calif., assignor to Scripps Clinic and Research Foundation, La Jolla, Calif.

Continuation-in-part of Ser. No. 906,143, Sep. 11, 1986, abandoned, which is a continuation-in-part of Ser. No. 882,082, Jul. 3, 1985, abandoned. This application Oct. 14, 1987, Ser. No. 108,833

Claims priority, application Canada, Jul. 3, 1987, 541192; PCT Int'l Appl., Jul. 6, 1987, PCT/US87/01652

Int. Cl.[4] A61K *31/33, 31/35, 31/13, 31/175*

U.S. Cl. 514—183 18 Claims

1. A method to modify a target condition contained within an environment with a conjugate active in modifying said target condition which conjugate comprises at least two components

which method comprises providing said environment with said components, which may be the same or different

wherein said components become covalently bonded to obtain the conjugate active in modifying said target condition when in the microenvironment of the target condition.

4,812,450

SPIRO(PIPERIDINE-PYRROLIDINE- OR HEXAHYDROAZEPINYL SUBSTITUTED) PYRROLO(2,1-C) (1,4)BENZOXAZEPINES)

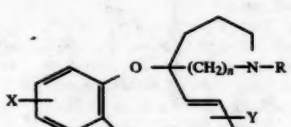
Richard C. Effland, Bridgewater; Larry Davis, Sergeantsville, and Kevin J. Kapples, Little York, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Jul. 30, 1987, Ser. No. 79,557

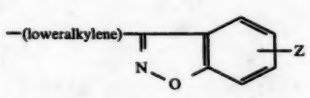
Int. Cl.[4] C07D *498/22, 403/04, 401/04;* A61K *31/555*

U.S. Cl. 514—211 30 Claims

1. A spiro(piperidine-, pyrrolidine- or hexahydroazepine)-pyrrolo[2,1a][1,4]benzoxazepine of the formula



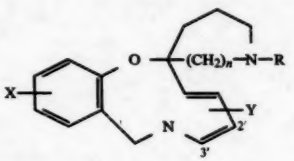
wherein R is hydrogen, loweralkyl, arylloweralkyl, acyl, loweralkynyl, loweralkynyl and



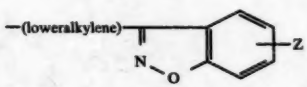
where Z is hydrogen, halogen, loweralkyl, loweralkoxy, CF_3,NO_2 and NH_2; X is hydrogen, halogen, loweralkoxy and trifluoromethyl; Y is hydrogen, 2' or 3' acyl, formyl, carbinol of the formula

where R_1 and R_2 are the same or different and are independently hydrogen, loweralkyl, arylloweralkyl, aryl, lower alkenyl, lower alkynyl and lower alkylbenzisoxazole; loweralkyl, loweralkenyl and halogen; and n is an integer of from 1 to 3 and the pharmaceutically acceptable acid addition salts thereof and where applicable to the geometric and stereo isomers thereof.

11. An analgesic composition which comprises an effective pain alleviating amount of a compound of the formula



wherein R is hydrogen, loweralkyl, arylloweralkyl, acyl, loweralkenyl, loweralkynyl, and



where Z is hydrogen, halogen, loweralkyl, loweralkoxy, CF_3, NO_2 and NH_2; X is hydrogen, halogen, loweralkoxy and trifluoromethyl; Y is hydrogen, 2' or 3' acyl, formyl, carbinol of the formula

where R_1 and R_2 are the same or different and are independently hydrogen, loweralkyl, arylloweralkyl, aryl, lower alkenyl, lower alkynyl and lower alkylbenzisoxazole; loweralkyl, loweralkenyl and halogen; and n is an integer of from 1 to 3 and the pharmaceutically acceptable acid addition salts thereof and where applicable to the geometric, stereo and optical isomers thereof; and a suitable carrier therefor.

4,812,451

1-(AMINOALKYL AND AMINOALKYLAMINO)CARBONYL AND THIOCARBONYL)-α,αDIARYLPYRROLIODINE, PIPERIDINE AND HOMOPIPERIDINEACETAMIDES AND ACETONITRILES

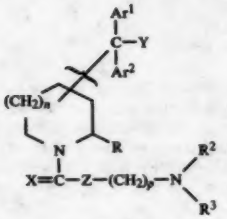
James R. Shanklin, Jr., and James M. Wilkinson, II, both of Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 662,583, Oct. 19, 1984, Pat. No. 4,594,343. This application Mar. 27, 1986, Ser. No. 845,148

Int. Cl.[4] A61K *31/445;* C07D *211/34*

U.S. Cl. 514—212 9 Claims

1. A compound selected from the group having the formula:



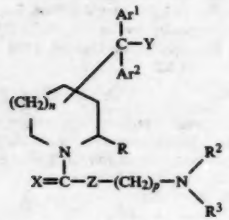
wherein;
n is selected from zero, one or two;
X is selected from oxgyen or sulfur;
Z is selected from

or —CH_2—;
p is selected from 0 to 5 inclusive with the proviso that when Z is

p is at least one;
Y is selected from aminocarbonyl or cyano;
Ar^1 and Ar^2, which may be the same or different, are selected from the group consisting of 2, 3 or 4-pyrido;
R is selected from hydrogen or loweralkyl;
R^1, R^2 and R^3 are selected from the group consisting of hydrogen, cycloalkyl, loweralkyl, phenyl, phenyl substituted by halogen, loweralkyl, or loweralkoxy and phenylloweralkyl wherein phenyl may be substituted by halogen, loweralkyl or loweralkoxy, and R^1, R^2 and R^3 may be the same or different and R^2 and R^3 taken together with the adjacent nitrogen atom may form a heterocyclic residue selected from pyrrolidino, piperidino, 4-phenylpiperidino, 2,6-diloweralkyl-piperidino, 4-hydroxy-4-phenylpiperidino, 4-cyano-4-phenylpiperidino, piperazino, 4-loweralkylpiperazino, 4-phenylpiperazino, (4-phenylloweralkyl)-piperazino, or 4-morpholino radicals;
and when the side group

is in the 3-position and Ar^1 and Ar^2 are dissimilar, the diastereoisomers thereof; and the pharmaceutically acceptable acid addition salts thereof.

7. A method of treating cardiac arrhythmias in an animal which comprises administering to said animal an effective amount of a compound having the formula:



wherein;
n is selected from zero, one or two;
X is selected from oxygen or sulfur;
Z is selected from

or —CH_2—;
p is selected from 0 to 5 inclusive with the proviso that when Z is

p is a least one;
Y is selected from aminocarbonyl or cyano;
Ar^1 and Ar^2, which may be the same or different, are selected from the group consisting of 2,3 or 4-pyrido;
R is selected from hydrogen or loweralkyl;
R^1, R^2 and R^3 are selected from the group consisting of hydrogen, cycloalkyl, loweralkyl, phenyl, phenyl substituted by halogen, loweralkyl, or loweralkoxy and phenylloweralkyl wherein phenyl may be substituted by halogen, loweralkyl or loweralkoxy, and R^1, R^2 and R^3 may be the same or different and R^2 and R^3 taken together with the adjacent nitrogen atom may form a heterocyclic residue selected from pyrrolidino, piperidino, 4-phenylpiperidino, 2,6-diloweralkyl-piperidino, 4-hydroxy-4-phenylpiperidino, 4-cyano-4-phenylpiperidino, piperazino, 4-loweralkylpiperazino, 4-phenylpiperazino, (4-phenylloweralkyl)-piperazino, or 4-morpholino radicals;
and when the side group

is in the 3-position and Ar^1 and Ar^2 are dissimilar, the diastereoisomers thereof; and the pharmaceutically acceptable acid addition salts thereof.

4,812,452

1-((AMINOALKYL AND AMINOALKYLAMINO) CARBONYL AND THIOCARBONYL)-α,α-DIARYLPYRROLIDINE, PIPERIDINE AND HOMOPIPERIDINEACETAMIDES AND ACETONITRILES

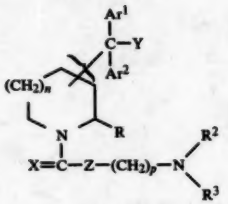
James R. Shanklin, Jr., and James M. Wilkinson, II, both of Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 662,583, Oct. 19, 1984, Pat. No. 4,594,343. This application Mar. 27, 1986, Ser. No. 845,170

Int. Cl.[4] A61K *31/445*; C07D *211/34*

U.S. Cl. 514—212 9 Claims

1. A compound selected from the group having the formula:



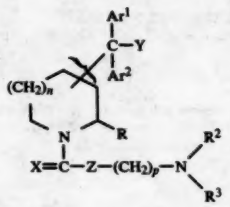
wherein;
n is selected from zero, one or two;
X is selected from oxygen or sulfur;
Z is selected from

or —CH_2—;
p is selected from 0 to 5 inclusive with the proviso that when Z is

p is at least one;
Y is selected from aminocarbonyl or cyanо;
Ar^1 and Ar^2, which may be the same or different, are selected from the group consisting of phenyl or phenyl substituted by 1 to 3 radicals which may be the same or different selected from loweralkyl, loweralkoxy, halogen or trifluoromethyl;
R is selected from hydrogen or loweralkyl;
R^1 is, selected from the group consisting of hydrogen, cycloalkyl, loweralkyl, phenyl, phenyl substituted by halogen, loweralkyl, or loweralkoxy and phenyl-loweralkyl wherein phenyl may be substituted by halogen, loweralkyl or loweralkoxy and R^2 and R^3 are taken together with the adjacent nitrogen atom to form a heterocyclic residue selected from pyrrolidino, piperidino, 4-phenyl-piperidino, 2,6-diloweralkyl-piperidino, 4-hydroxy-4-phenyl-piperidino, 4-cyano-4-phenylpiperidino, piperazino, 4-loweralkylpiperazino, 4-phenylpiperazino, (4-phenylloweralkyl)-piperazino, or 4-morpholino radicals;
and when the side group

is in the 3-position and Ar^1 and Ar^2 are dissimilar, the diastereoisomers thereof; and the pharmaceutically acceptable acid addition salts thereof.

7. A method of treating cardiac arrhythmias in an animal which comprises administering to said animal an effective amount of a compound having the formula:



wherein;
n is selected from zero, one or two;
X is selected from oxygen or sulfur;
Z is selected from

or —CH_2;
p is selected from 0 to 5 inclusive with the proviso that when Z is

p is at least one;
Y is selected from aminocarbonyl or cyano;
Ar^1 and Ar^2, which may be the same or different, are selected from the group consisting of phenyl or phenyl substituted by 1 to 3 radicals which may be the same or different selected from loweralkyl, loweralkoxy, halogen or trifluoromethyl;
R is selected from hydrogen or loweralkyl;
R^1 is, selected from the group consisting of hydrogen, cycloalkyl, loweralkyl, phenyl, phenyl substituted by halogen, loweralkyl, or loweralkoxy and phenyl-loweralkyl wherein phenyl may be substituted by halogen, loweralkyl or loweralkoxy and R^2 and R^3 are taken together with the adjacent nitrogen atom to form a heterocyclic residue selected from pyrrolidino, piperidino, 4-phenylpiperidino, 2,6-diloweralkyl-piperidino, 4-hydroxy-4-phenylpiperidino, 4-cyano-4-phenylpiperidino, piperazino, 4-loweralkylpiperazino, 4-phenylpiperazino, (4-phenylloweralkyl)-piperazino, or 4-morpholino radicals;
and when the side group

is in the 3-position and Ar^1 and Ar^2 are dissimilar, the diastereoisomers thereof; and the pharmaceutically acceptable acid addition salts thereof.

4,812,453

USE OF 1-BENZYL-AMINOALKYL-PYRROLIDINONES AS ANTIDEPRESSANTS

Erich Lehr, Waldalgesheim; Wolf-Dietrich Bechtel, Appenheim; Karin Boke-Kuhn, Gau-Algesheim; Claus Schneider, Ingelheim am Rhein; Gerhard Walther, Bingen, and Karl-Heinz Weber, Gau-Algesheim, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

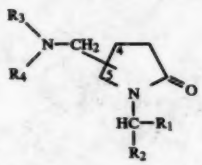
Filed Sep. 29, 1987, Ser. No. 102,074

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1986, 3634220

Int. Cl.[4] A61K *31/495*

U.S. Cl. 514—255 1 Claim

1. A method of treating depression which comprises administering, to a human host suffering from depression an antidepressive amount of a compound of the formula I



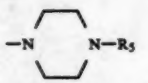
I

wherein

R_1 represents hydrogen or a C_2–C_4 alkyl group,

R_2 represents a phenyl group which may be mono- or disubstituted by C_1–C_2 alkoxy, fluorine, chlorine, bromine trifluoromethyl, C_1–C_4 alkyl, hydroxy or nitro, or R_2 represents a pyridyl group, and

R_3 and R_4 together with the nitrogen atom represent a group of the formula



wherein R_5 is H or methyl, or a pharmaceutically acceptable acid addition salt thereof.

4,812,454

NITROMETHYLENE DERIVATIVES AND THEIR USE AS INSECTICIDES

Kozo Shiokawa, Kanagawa; Shinichi Tsuboi, Tokyo; Shinzo Kagabu, Tokyo; Koichi Moriya, Tokyo, all of Japan, and Bernd Bassner, Leverkusen, Fed. Rep. of Germany, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

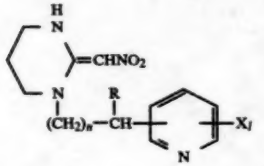
Division of Ser. No. 899,190, Aug. 22, 1986, Pat. No. 4,772,620. This application Oct. 19, 1987, Ser. No. 109,803

Claims priority, application Japan, Aug. 27, 1985, 60-186592

Int. Cl.[4] A61K *31/435, 31/495;* C07D *401/08*

U.S. Cl. 514—256 8 Claims

1. A nitromethylene derivative of the formula



wherein

R is a hydrogen atom or an alkyl group having 1 to 4 carbon atoms,

X is a halo-C_1–C_4 alkyl group, a halo-C_1–C_4 alkoxy group, a halo-C_1–C_4 alkylthio group, a halo-C_1–C_4 alkylsulfinyl group, a halo-C_1–C_4 alkylsulfonyl group, a nitro group, a cyano group, a thiocyanato group, a halo-C_2–C_3 alkenyl group, a halo-C_2–C_3 alkynyl group, a hydroxyl group, a C_1–C_2 alkoxycarbonyl group, an amino group, an acetyl group, a di-C_1–C_2 alkylamino group, an acetamide group or a methoxy group,

l is 1 or 2 provided that, when l is 1 X does not represent a methoxy group, and when l is 2 at least one X is not a methoxy group, and

n is 0 or 1.

7. A method of combating insects which comprises applying to such insects or to an insect habitat an insecticidally effective amount of a compound according to claim 1.

4,812,455

ANTIINFLAMMATORY COMPOSITIONS AND METHODS

Thomas C. Crawford; Stanley L. Keely; David L. Larson; Joseph G. Lombardino, and James J. Maciejko, all of Groton, Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 941,140, Dec. 12, 1986, Pat. No. 4,766,117, which is a division of Ser. No. 821,183, Jan. 21, 1986, Pat. No. 4,672,061, which is a division of Ser. No. 695,590, Jan. 28, 1985, Pat. No. 4,579,846, which is a continuation-in-part of Ser. No. 659,602, Oct. 11, 1984, abandoned. This application Apr. 11, 1988, Ser. No. 179,829

Int. Cl.[4] A61U *31/54*

U.S. Cl. 514—226.5 4 Claims

1. An antiinflammatory composition in the form of a tablet, capsule or powder for oral administration which comprises a mixture of:

(a) an antiinflammatory amount of piroxicam, or a pharmaceutically-acceptable salt thereof;

(b) a gastric antiirritation and ulcer-inhibiting amount of trimazosin, or a pharmaceutically-acceptable salt thereof; and

(c) a pharmaceutically-acceptable carrier.

4,812,456

1-(N-(2-ALKYLTHIO-10H-PHENOTHIAZIN-10-YL)ALKYL)-4-BENZOYLPIPERIDINES AND PHARMACEUTICAL USE

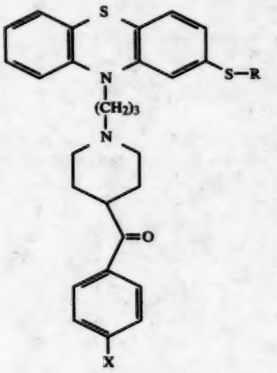
Grover C. Helsley, Pluckemin; Larry Davis, Sergeantsville, and Gordon E. Olsen, Somerset, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed May 13, 1987, Ser. No. 49,234

Int. Cl.[4] A61K *31/54;* C07D *417/06*

U.S. Cl. 514—225.5 7 Claims

1. A compound of the formula



wherein R is an alkyl radical having up to 6 carbon atoms, inclusive; and X is a radical selected from the group consisting of fluorine, chlorine, bromine, iodine, and trifluoromethyl, the geometrical isomers, optical antipodes, or pharmaceutically acceptable acid addition salts thereof.

6. A method of alleviating pain comprising administering to a mammal in need of pain alleviation, a pain alleviating effective amount, of a compound as defined in claim 1.

7. A method of treating psychosis comprising administering to a mammal in need of psychosis treatment a psychosis treating effective amount of a compound as defined in claim 1.

4,812,457
PROSTAGLANDIN DERIVATIVES

Shuh Narumiya; Osamu Hayaishi, both of Kyoto; Yoshiharu Kimura, Omihachiman, and Masami Tsuboshima, 13-2, Nakasajijo-cho, Ibaraki-shi, Osaka-fu, Japan, assignors to Research Development Corporation, Osaka and Masami Tsuboshima, Tokyo, both of, Japan

Continuation of Ser. No. 793,826, Nov. 1, 1985, abandoned. This application Jan. 29, 1988, Ser. No. 149,930

Claims priority, application Japan, Nov. 21, 1984, 59-247241

Int. Cl.[4] C07C 177/00; A61K 31/557

U.S. Cl. 514—226.2 **5 Claims**

1. A compound selected from the group consisting of (a) an ester of a prostaglandin with an alcohol selected from the group consisting of retinol and hydroxyacetylretinol, and (b) prostaglandin phenothiazine amide; the prostaglandin of the prostaglandin ester and the prostaglandin of the prostaglandin phenothiazine amide, each being selected from the group consisting of PGA_1, PGA_2, PGB_1, PGB_2, PGC_2, PGD_2, PGE_1, PGE_2, PGE_3, $PGF_{1\alpha}$, $PGF_{2\alpha}$, $PGF_{3\alpha}$, PGG_2, PGH_2, PGI_2, Δ^{12}-PGJ_2, 9,11 -dimethylmethano-11,12-methano-16-phenyl-13,14-dihydro-13-aza-15$\alpha\beta$-ω-tetranorthromboxan-A_2(ONO-1120), and 5-(6-carboxyhexyl)-1-(3-cyclohexyl-3-hydroxypropyl-hydantoin(BW245C).

4,812,458
6,7-DISUBSTITUTED-2,3-DIHYDROXYQUINOXALINE COMPOUNDS, PHARMACEUTICAL COMPOSITIONS THEREOF, AND THEIR USE AS NEUROLEPTICS

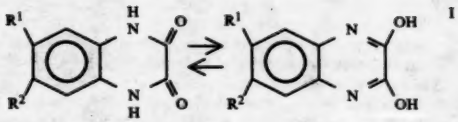
Tage Honore, Malov; Jorgen Drejer, Bronshoj; Poul Jacobsen, Rodovre, and Flemming E. Nielsen, Virum, all of Denmark, assignors to A/S Ferrosan, Soborg, Denmark

Continuation-in-part of Ser. No. 907,865, Sep. 16, 1986. This application Sep. 2, 1987, Ser. No. 92,034

Int. Cl.[4] A61K 31/495; C07D 241/44

U.S. Cl. 514—249 **8 Claims**

1. A heterocyclic dihydroxyquinoxaline compound having the formula I



I

wherein

R^1 is halogen, CN, CF_3, ethynyl, or N_3 and

R^2 is SO_2C_{1-3}-alkyl, CF_3, NO_2, ethynyl, or CN.

4,812,459
ANTI-HYPERTENSIVE PYRANOPYRIDINE COMPOUNDS

John M. Evans, Roydon; Geoffrey Stemp, and Frederick Cassidy, both of Harlow, all of England, assignors to Beecham Group p.l.c., England

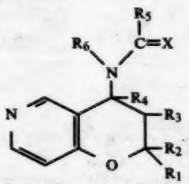
Filed Jun. 6, 1986, Ser. No. 871,711

Claims priority, application United Kingdom, Jun. 8, 1985, 8514538; Nov. 9, 1985, 8527713

Int. Cl.[4] A61K 31/495, 31/40; C07D 491/02

U.S. Cl. 514—254 **9 Claims**

1. A compound of formula (I) or a pharmaceutically acceptable salt thereof:



(I)

wherein one of

R_1 and R_2 is hydrogen or C_{1-4} alkyl and the other is C_{1-4} alkyl or R_1 and R_2 together are C_{2-5} polymethylene;

either R_3 is hydrogen, hydroxy, C_{1-6} aklkoxy or C_{1-7} acyloxy and R_4 is hydrogen or R_3 and R_4 together are a bond;

R_5 is hydrogen; C_{1-6} alkyl optionally substituted by up to three halo atoms, by hydroxy, C_{1-6} alkoxy, C_{1-6} alkoxycarbonyl, carboxy; amino optionally substituted by one or two independent C_{1-6} alkyl groups or pyrrolidinyl or piperidinyl; C_{2-6} alkenyl; amino optionally substituted by a C_{1-6} alkyl or C_{1-6} alkenyl group or by a C_{1-6} alkanoyl group optionally substituted by up to three halo atoms, by a phenyl group optionally substituted by one C_{1-6} alkyl, C_{1-6} alkoxy or halogen; or a member selected from the group consisting of phenyl, naphthyl, furyl, thienyl, pyrryl, oxazolyl, thiazolyl, imiazolyl, thiadiazolyl, pyridyl, pyridazyl pyrimidyl, pyrazyl, triazyl, benzofuranyl, benzothienyl, indolyl, indazolyl, quinolyl, isoquinolyl and quinazolyl, said member being optionally substituted by one to four groups or atoms selected from the class of C_{1-6} alkyl, C_{1-6} alkoxy, hydroxy, halogen, trifluoromethyl, nitro, cyano, C_{1-12} carboxylic acyl, or amino or aminocarbonyl optionally substituted by one or two C_{1-6} alkyl groups; or

(when X is 0), R_5 is selected from the class of carboxy, C_{1-6} alkoxycarbonyl, or aminocarbonyl optionally substituted by one or two C_{1-6} alkyl groups; and

R_6 is hydrogen or C_{1-6} alkyl; or

R_5 and R_6 together are $—CH_2—(CH_2)_n—Z—(CH_2)_m—$ wherein m and n are to 2 such that m+n is 1 or 2 and Z is CH_2, 0, S or NR wherein R is hydrogen, C_{1-9} alkyl, C_{2-7} alkanoyl, phenyl C_{1-4} alkyl, naphthylcarbonyl, phenylcarbonyl or benzylcarbonyl optionally substituted in the phenyl or naphthyl ring by one or two of C_{1-6} alkyl, C_{1-6} alkoxy or halogen; or R is heteroarylcarbonyl wherein the

heteroaryl moiety is a member selected from the group consisting of furyl, thienyl, pyrryl, oxazolyl, thiazolyl, imidazolyl, thiadiazolyl, pyridyl, pyridazyl, pyrimidyl, pyrazyl, triazyl, benzofuranyl, benzothienyl, indolyl, indazolyl, quinolyl, isoquinolyl and quinazoiyl;

X is oxygen or sulphur; and

the nitrogen containing group in the 4-position being trans to the R_3 group when R_3 is hydroxy, C_{1-6} alkoxy or C_{1-7} acyloxy.

9. A method of treatment of hypertension in mammels, which comprises administering to the mammal an antihypertensive effective amount of a compound according to claim 1 or a pharmaceutically acceptable salt thereof.

4,812,460

3-[2-(3',5'-DI-T-BUTYL-4'-HYDROXYPHENYL)ETHENYL]PYRIDINE

Edward S. Lazer, Trumbull, Conn., assignor to Boehringer Ingelheim Pharmaceutical, Inc., Ridgefield, Conn.

Division of Ser. No. 843,898, Mar. 25, 1986, Pat. No. 4,743,606. This application Dec. 21, 1987, Ser. No. 135,886

Int. Cl.[4] C07D *211/70*; A61K *31/44*

U.S. Cl. 514—277 **2 Claims**

1. 3-[2-(3',5'-di-tert-butyl-4'-hydroxyphenyl)ethenyl]pyridine.

4,812,461

IMIDE DERIVATIVES AND THEIR USE IN THE TREATMENT PSYCHOSIS

Fujio Antoku, Hyogo; Mayumi Yoshigi; Ikutaro Saji, both of Osaka; Atsuyuki Kojima, Hyogo, and Kukuo Ishizumi, Osaka, all of Japan, assignors to Sumitomo Pharmaceuticals Company, Limited, Osaka, Japan

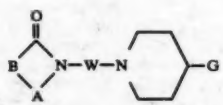
Filed Sep. 25, 1987, Ser. No. 100,824

Claims priority, application Japan, Sep. 26, 1986, 61-228795

Int. Cl.[4] A61K *31/445*; C07D *401/06*

U.S. Cl. 514—278 **18 Claims**

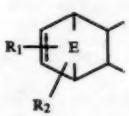
1. A compound of the formula:



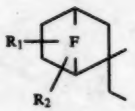
wherein

A is a carbonyl group or a sulfonyl group;

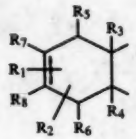
B is either one of the following formulas:



wherein R_1 and R_2 are each a hydrogen atom, or either one of R_1 and R_2 is a hydrogen atom and the other is a hydroxyl group, a lower alkyl group or a lower alkanoyloxy group, or R_1 and R_2 are combined together to represent an oxo group, E is a methylene group, an ethylene group or an oxygen atom and a full line accompanying a broken line (---) indicates a single bond or a double bond,



wherein F is a methylene group or an ethylene group and R_1, R_2 and a full line accompanying a broken line (---) are each as defined above,



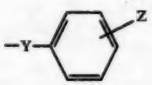
wherein R_3, R_4, R_5, R_6, R_7 and R_8 are each a hydrogen atom or a lower alkyl group and R_1, R_2 and a full line accompanying a broken line (---) are each as defined above,

wherein R_9 and R_{10} are each a lower alkyl group,

or B is a 1,2-phenylene group when A represents a sulfonyl group;

W is a lower alkylene group, a lower alkenylene group, a lower alkynylene group or a lower alkylene group substituted with hydroxyl; and

G is a benzoisothiazolyl group, a benzoisothiazolyl substituted with a member selected from the group consisting of lower alkyl, lower alkoxy, halogen, and halogenated lower alkyl, or a group of the formula:



wherein Y is an oxygen atom, a carbonyl group, a methylene group, a group of the formula:

wherein m is an integer of 0, 1 or 2, a group of the formula:

wherein R_{13} is a hydrogen atom, a lower alkyl group or a lower alkanoyl group or a group of the formula:

and Z is a hydrogen atom, a halogen atom, a lower alkyl group or a lower alkoxy group, or a pharmaceutically acceptable salt thereof.

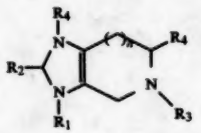
4,812,462

4,5,6,7-TETRAHYDRO-1H-IMIDAZO[4,5-C]PYRIDINE-6-CARBOXYLIC ACID ANALOGS HAVING ANTIHYPERTENSIVE ACTIVITY

C. John Blankley; John C. Hodges; John S. Kiely, and Sylvester R. Klutchko, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Apr. 1, 1986, Ser. No. 847,067
Int. Cl.[4] C07D *471/04*; A61K *31/44*
U.S. Cl. 514—303 16 Claims

1. A compound having the formula (I)



I

and their pharmaceutically acceptable base or acid addition salts; wherein

(1) is a single or a double bond;

(2) - - - one of R_1 is present and is

(a) alkyl of from four to twenty carbons, inclusive,

(b)

wherein y is zero, one, two, three, four or five, R′ is cycloalkyl of from four to twenty carbons, inclusive in a one, two or three saturated ring system, said ring consisting of from four to eight carbons inclusive, each ring unsubstituted or substituted by a straight or branched lower alkyl group, naphthyl, heteroaryl consisting of 2-, 3-, or 4-pyridyl; 1-, 2-, or 4-imidazolyl; 1-, 2-, 3-, 4-, 5-, 6-, or 7-indolyl; 2-, or 3-thienyl; 2-, or 3-furyl; or 1-, 2-, or 3-pyrazolyl, phenyl unsubstituted or substituted with of from one through five substituents selected from the group consisting of lower alkyl, halo, trifluoromethyl, hydroxy, lower alkoxy, lower alkyl acyloxy, amino, N-lower monoalkylamino, N,N-lower dialkylamino, lower thioalkyl, lower alkylsulfonyl, nitro and

wherein R_{10} is lower alkyl, phenyl unsubstituted or substituted by lower alkyl, or —NHR_{11} wherein R_{11} is hydrogen or lower alkyl, and R″ is hydrogen, lower alkyl, cycloalkyl of from four to twenty carbons, inclusive in a one two or three saturated ring system, said ring consisting of from four to eight carbons inclusive, each ring unsubstituted or substituted by a straight or branched lower alkyl group, naphthyl, phenyl unsubstituted or substituted with of from one through five substituents selected from the group consisting of alkyl, halo, trifluoromethyl, amino, N-lower monoalkylamino, N,N-lower dialkylamino, lower thioalkyl, lower alkylsulfonyl, and nitro;

(3) R_2 is

(a) hydrogen,

(b) halo,

(c) lower alkyl,

(d) R′—$(CH_2)_x$— wherein x is one, two, three, four, or five and R′ is independently as defined above,

(e)

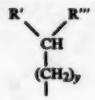
wherein R′ is independently as defined above, or

(f) R′—CH(OH)— wherein R′ is independently as defined above;

(4) R_3 is

(a) R′ $\overset{\text{—(CH—)}_x\text{—}}{}$ wherein x and R′ are independently as defined above,

(b)

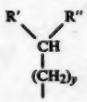


wherein R′ and y are independendently as defined above, and R‴ is lower alkyl, cycloalkyl, of from four to twenty carbons, inclusive in a one, two or three saturated ring system, said ring consisting of from four to eight carbons inclusive, each ring unsubstituted or substituted by a straight or branched lower alkyl group, naphthyl, phenyl unsubstituted or substituted with of from one to five substituents selected from the group consisting of alkyl, halo, trifluoromethyl, amino, N-lower monoalkylamino, N,N-lower dialkylamino, lower thioalkyl, lower alkylsulfonyl, and nitro;

wherein R_5 is

(i) alkyl of from one to fifteen carbons, inclusive,

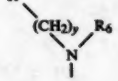
(ii)



wherein R′, R″, and y are independently as defined above,

(iv) —CH=CR_6—R_1 wherein R_6 is hydrogen or lower alkyl and R_1 is as defined above,

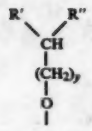
(v)



wherein y, R′ and R_6 are independently as defined above,

(vi) R′—CH_2—$_y$—O— wherein y and R′ are independently as defined above,

(vii)



wherein R', R", and y are independently as defined above,

(d)

wherein R_5 is independently as defined above;

(5) R_4 is

(a) $-CH_2OR_7$ wherein R_7 is hydrogen, lower acyl, a lower alkyl,

(b)

wherein R_7 is independently as defined above and R_8 is hydrogen, lower alkyl, or benzyl,

(c)

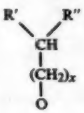
(d) $-C{\equiv}N$,

(e)

wherein R_9 is hydrogen, lower alkyl, or benzyl; and

(6) n is one; with the overall proviso that R_9 cannot be hydrogen, methyl or ethyl when R_3 is $R'-(CH_2)_x-$ or

wherein R_5 is $R'-(CH_2)_yO-$ or



wherein each of R', R", x, and y are as defined above.

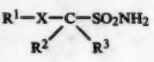
4,812,463

ALKANESULFONAMIDES AS ANTIGLAUCOMA AGENTS

Samuel L. Graham, Harleysville, and Thomas H. Scholz, Souderton, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 880,535, Jun. 30, 1986, abandoned.
This application Dec. 10, 1987, Ser. No. 131,486
Int. Cl.[4] A61K *31/47, 31/64;* C07C *143/72, 433/02*
U.S. Cl. 514—311 10 Claims

1. A compound of structural formula:



wherein

X is SO_2

R^1 is

(a) thienyl, either unsubstituted or substituted with one or more of:

(i) R^5, which is C_{1-5} alkyl, either straight or branched chain either unsubstituted or substituted with one or more of $-OR^4$, wherein R^4 is hydrogen, C_{1-3} alkyl, or C_{2-4} alkanoyl,

(ii)

wherein n is 0, 1 or 2 and R^5 is as defined above

(b) C_{1-8} alkyl either straight chain or branched chain, and either unsubstituted or substituted with

(i) carbocyclic or heterocyclic aromatic such phenyl, naphthyl, pyridyl, thienyl, imidazolyl or quinolinyl, either unsubstituted or substituted with:

(1) OR^4 or

(2) R^5; wherein R^4 and R^5 are as defined above

R^2 is hydrogen, and R^3 is hydrogen, chloro, or fluoro.

5. A method of treating elevated intraocular pressure and glaucoma which comprises the administration to a patient in need of such treatment an effective intraocular pressure lowering amount of the compound of claim 1.

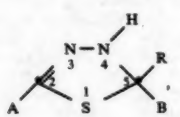
4,812,464

PESTICIDAL 2-PYRIDYL-4,5-DIHYDRO-1,3,4-THIADIAZOLES

Saleem Farooq, Arisdorf; Josef Ehrenfreund, and Hans-Rudolf Waespe, both of Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 7, 1987, Ser. No. 129,199
Claims priority, application Switzerland, Dec. 18, 1986, 5059/86
Int. Cl.[4] C07D *401/00, 405/00;* A01N *43/48*
U.S. Cl. 514—333 11 Claims

1. A 2-pyridyl-4,5-dihydro-1,3,4-thiadiazole of formula I



(I)

wherein

A is the 2-, 3- or 4-pyridyl radical,

B is hydrogen, C_1–C_4alkyl or the 2, 3- or 4-pyridyl radical,

R is hydrogen, C_1–C_4alkyl, benzyl or 1- or 2-naphthyl which is unsubstituted or substituted by halogen, nitro, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4alkoxy-C_1–C_4-alkyl or halo-C_1–C_4alkyl.

8. A method of controlling insects and representatives of the order Acarina, which comprises treating or contacting said pests, their various development stages or the locus thereof, with a pesticidally effective amount of a compound of formula I according to claim 1 or with a composition which contains a pesticidally effective amount of such a compound, together with adjuvants and carriers suitable therefor.

4,812,465

TRIAZOLE DERIVATIVES FOR USE AS ANTIMYCOTIC AGENTS

Karl Schermanz, Graz; Gerald Saischek, Wels; Robert Urmann, and Kurt Martetschläger, both of Linz, all of Austria, assignors to CL Pharma Aktiengesellschaft, Linz, Austria

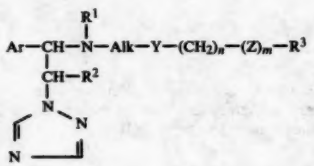
Filed Dec. 23, 1987, Ser. No. 137,551

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1986, 3644615

Int. Cl.[4] C07D *249/08, 401/00;* A61K *31/41*

U.S. Cl. 514—340 **9 Claims**

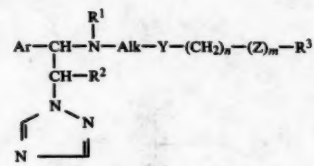
1. A triazole derivative of the formula:



1

in which Ar is thienyl or is phenyl, biphenylyl or naphthyl, each of which is substituted by halogen, lower alkyl or lower alkoxy, R^1 is hydrogen or lower alkyl, Alk is straight-chain or branched alkylene having 1 to 10 carbon atoms, Y is oxygen, sulfur, sulfinyl or sulfonyl, n is zero 1 or 2, Z is oxygen sulfur or sulfinyl, m is zero or 1, R^3 is hydrogen, straight-chain or branched alkyl having 1 to 12 carbon atoms, cyclohexyl, or is phenyl which is optionally substituted by hydroxyl, halogen, trifluoromethyl, lower alkyl or lower alkoxy, or is biphenylyl, pyridyl or is naphthyl which is optionally substituted by halogen, and R^2 is hydrogen or lower alkyl, or a pharmaceutically acceptable acid addition salt.

8. A method for the treatment or prevention of a mycotic infection in a patient which comprises administering to the patient an antimycotic-effective amount of a triazole derivative of the formula:



I

in which Ar is thienyl or is phenyl, biphenylyl or naphthyl each of which is substituted by halogen, lower alkyl or lower alkoxy, R^1 is hydrogen or lower alkyl, Alk is straight-chain or branched alkylene having 1 to 10 carbon atoms, Y is oxygen, sulfur, sulfinyl or sulfonyl, n is zero, 1 or 2, Z is oxygen, sulfur or sulfinyl, m is zero or 1, R^3 is hydrogen, straight-chain or branched alkyl having 1 to 12 carbon atoms, cyclohexyl, or is phenyl which is optionally substituted by hydroxyl, halogen, trifluoromethyl, lower alkyl or lower alkoxy, or is biphenylyl, pyridyl or is naphthyl which is optionally substituted by halogen, and R^2 is hydrogen or lower alkyl, or a pharmaceutically acceptable acid addition salt.

4,812,466

PYRIDYLOXY-SUBSTITUTED PHENYLCARBODIIMIDES AS PESTICIDES

Manfred Böger, Weil am Rhein, Fed. Rep. of Germany, and Jozef Drabek, Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

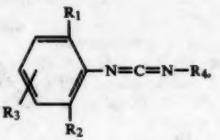
Continuation of Ser. No. 776,257, Sep. 16, 1985, abandoned. This application Oct. 26, 1987, Ser. No. 115,633

Claims priority, application Switzerland, Sep. 19, 1984, 4479/84; Aug. 15, 1985, 3526/85

Int. Cl.[4] C07D *213/64;* A01N *43/40*

U.S. Cl. 514—351 **19 Claims**

1. A compound of formula I



(I)

wherein

R_1 is hydrogen, fluorine, chlorine, C_1–C_4alkyl, methoxy, ethoxy, trifluoromethoxy or C_1–C_3alkylthio;

R_2 is hydrogen, fluorine, chlorine, C_1–C_4alkyl, methoxy or ethoxy;

R_3 is pyrid-2-yloxy or pyrid-2-yloxy which is mono- or disubstituted by a member selected from the group consisting of halogen and C_1–C_3haloalkyl having 1 to 7 halogen atoms;

R_4 is C_1–C_{12}alkyl, alkoxyalkyl having a total of 2 to 10 carbon atoms, C_3–C_{10}cycloalkyl, C_3–C_{10}cycloalkylmethyl, C_3–C_{10}cycloalkyl which is substituted by 1 to 3 C_1–C_3alkyl groups, or is C_1–C_5alkyl which is substituted by 1 or 2 C_3–C_{10}cycloalkyl groups, or is a polycyclic alkyl group having 7 to 10 carbon atoms, phenyl(C_1–C_5)alkyl or phenyl(C_1–C_5)alkyl which is mono- or disubstituted at the phenyl nucleus by halogen, trifuloromethyl, methoxy or ethoxy.

19. A method of controlling ectoparasites selected from *Lucilia sericata* and ticks in domestic animals and productive livestock, which method comprises treating said animals or their habitat with an ectoparasitically effective amount of a compound of formula I according to claim 1.

4,812,467

N-(IMIDAZOLYLMETHYL)DIPHENYLAZOMETHINES AND COMPOSITIONS CONTAINING THEM

Jacques Comarmond, Paris; Thomas Purcell, Montfort l'Amaury, and Lydia Zard, Gif s/Yvette, all of France, assignors to Synthelabo, France

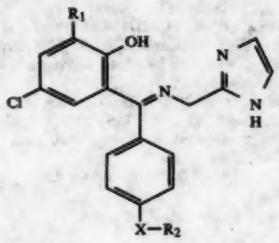
Filed Jun. 26, 1987, Ser. No. 66,531

Claims priority, application France, Jun. 27, 1986, 86 09331

Int. Cl.[4] A61K *31/415;* C07D *233/64*

U.S. Cl. 514—341 **4 Claims**

1. A compound which is selected from an N-(imidazolylmethyl diphenylazomethine derivative of the formula (I)



(I)

wherein

R_1 is selected from chlorine and methyl,

X is a group selected from thio and sulphonyl groups, and

R_2 is a group selected from 2-pyridyl group, a phenyl group unsubstituted or substituted by at least one substituent selected from a methyl, one halogen atom and two halogen atoms, and a benzyl group unsubstituted or substituted by a substituent selected from a halogen atom, a methyl group and a methoxy group, and an addition salt thereof with a pharmaceutically acceptable acid.

4,812,468

PHENYLCARBOXIMIDATES AS PESTICIDES

Manfred Böger, Weil am Rhein, Fed. Rep. of Germany, and Jozef Drabek, Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 658,004, Oct. 4, 1984, Pat. No. 4,723,015. This application Nov. 13, 1987, Ser. No. 120,288

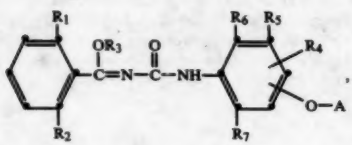
Claims priority, application Switzerland, Oct. 17, 1983, 5627/83; Aug. 13, 1984, 3870/84

The portion of the term of this patent subsequent to Feb. 2, 2005, has been disclaimed.

Int. Cl.[4] C07D *213/63;* A01N *43/40*

U.S. Cl. 514—346 **15 Claims**

1. A compound of the formula I



(I)

wherein

R_1 is hydrogen, halogen or methyl,

R_2 is halogen, methyl or trifluoromethyl,

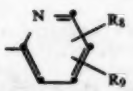
R_3 is C_1–C_5alkyl, C_1–C_3haloalkyl containing 1 to 3 halogen atoms,

R_4 is hydrogen or methyl,

R_5 is methyl,

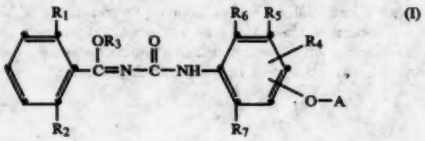
R_6 and R_7 are hydrogen, and

A is the



radical, in which R_8 is hydrogen, chlorine, trifluoromethyl or perhalogenated ethyl, and R_9 is hydrogen, halogen, methoxy or ethoxy.

10. A method of controlling pests selected from insects and representatives of the order Acarina, which comprises contacting said pests, their various development stages or the locus thereof, with a pesticidally effective amount of a compound of the formula I



(I)

wherein

R_1 is hydrogen, halogen, methyl or methoxy,

R_2 is halogen, methyl trifluoromethyl or methoxy,

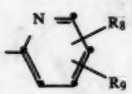
R_3 is C_1–C_5alkyl, C_1–C_3haloalkyl containing 1 to 3 halogen atoms,

R_4 is hydrogen or methyl,

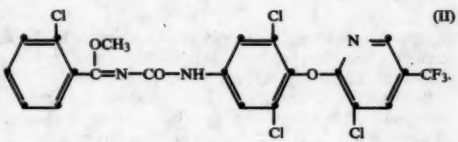
R_5 is methyl,

R_6 and R_7 are hydrogen, and

A is the



radical, in which R_8 is hydrogen, chlorine, trifluoromethyl or perhalogenated ethyl, and R_9 is hydrogen, halogen, methoxy or ethoxy, or of the formula II



(II)

4,812,469

ACETAMIDES DERIVED FROM 2,3-DIHYDRO-3-PHENYL-2-BENZOFURANONE

Gilbert Lavielle, LaCelle Saint-Cloud, and Jean Lepagnol, Chatou, both of France, assignors to Adir Et Cie, Neuilly-sur-Seine, France

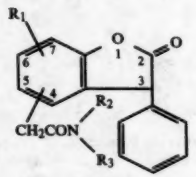
Filed Feb. 12, 1988, Ser. No. 155,353

Claims priority, application France, Feb. 27, 1987, 87 02631

Int. Cl.[4] A61K *31/34;* C07D *307/78*

U.S. Cl. 514—466 **9 Claims**

1. A compound of the general formula I



(I)

in which:

either R_1 is at the 7-position and the acetamido group is at the 5-position, or R_1 is at the 5-position and the acetamido group is at the 7-position,

R_1 is a hydrogen or halogen atom,

R_2 R_3, which may be identical or different, each is a hydrogen atom or a linear or branched alkyl radical containing 1 to 4 carbon atoms, or a benzyl radical optionally substituted or with a halogen atom, with an alkoxy radical

containing 1 to 4 carbon atoms, or with an alkyl radical having 1 to 4 carbon atoms, or with a 3,4-methylenedioxy radical,

or an addition salt thereof with a pharmaceutically-acceptable inorganic or organic acid.

4. A method of treating a disease linked to hypoxemia and to energy insufficiency or cerebral aging in a subject suffering therefrom comprising the step of administering to the said subject an amount of a compound of claim 1 which is effective for the alleviation of such disease.

4,812,470

ANTIBACTERIAL MONIC ACID DERIVATIVES

Norman H. Rogers, Horsham; Peter J. O'Hanlon, Redhill; Graham Walker, Guildford, and Michael J. Crimmin, Horsham, all of England, assignors to Beecham Group p.l.c., England

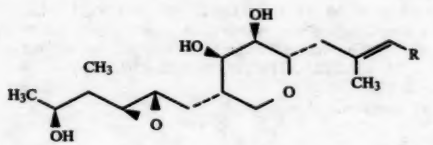
Filed Feb. 25, 1983, Ser. No. 469,819

Claims priority, application United Kingdom, Feb. 27, 1982, 8205842; Oct. 28, 1982, 8230800

Int. Cl.[4] A61K *31/41*; A01N *43/78*

U.S. Cl. 514—365 **13 Claims**

1. A compound of the formula (I):



(I)

wherein R is

wherein R^1 and R^2 are the same or different and each is

(a) hydrogen;

(b) phenyl unsubstituted or mono-substituted by halo, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, hydroxy, carboxy, alkoxycarbonyl of 1 to 6 carbon atoms in the alkoxy moiety, carbamoyl, mono- or di-alkylcarbamoyl of 1 to 6 carbon atoms in each alkyl moiety, sulphamoyl, mono- or di-alkylsulphamoyl of 1 to 6 carbon atoms in each alkyl moiety, cyano, nitro, amino, mono- or di-alkylamino of 1 to 6 carbon atoms in each alkyl moiety, acylamino of 1 to 6 carbon atoms in the acyl moiety, ureido, alkoxycarbonylamino of 1 to 6 carbon atoms in the alkoxy moiety, 2,2,2-trichloroethoxycarbonylamino, alkanoyl of 1 to 6 carbon atoms in the alkyl moiety, alkylthio of 1 to 6 carbon atoms in the alkyl moiety, alkanesulphinyl of 1 to 6 carbon atoms in the alkyl moiety or alkanesulphonyl of 1 to 6 carbon atoms in the alkyl moiety;

(c) a 5-or 6-membered heterocycle having from 1 to 3 heteroatoms selected from the group consisting of oxygen, nitrogen and sulphur, said heterocycle being unsubstituted or mono-substituted by halo, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, hydroxy, carboxy, alkoxycarbonyl of 1 to 6 carbon atoms, carbamoyl, mono- or di-alkylcarbamoyl of 1 to 6 carbon atoms in each alkyl moiety, sulphamoyl, mono- or di-alkylsulphamoyl of 1 to 6 carbon atoms in each alkyl moiety, cyano, nitro, amino, mono- or di-alkylamino of 1 to 6 carbon atoms in each alkyl moiety, acylamino of 1 to 6 carbon atoms in the acyl moiety, ureido, alkoxycarbonylamino of 1 to 6 carbon atoms in the alkoxy moiety, 2,2,2-trichloroethoxy-carbonylamino, alkanoyl of 1 to 6 carbon atoms in the alkyl moiety, alkylthio of 1 to 6 carbon atoms in the alkyl moiety, alkanesulphinyl of 1 to 6 carbon atoms in the alkyl moiety or alkanesulphonyl of 1 to 6 carbon atoms in the alkyl moiety;

(d) alkyl of 1 to 20 carbon atoms, alkenyl of 2 to 8 carbon atoms or alkynyl of 2 to 8 carbon atoms unsubstituted or mono-substituted by halo, carboxy, alkoxcarbonyl of 1 to 6 carbon atoms in the alkoxy moiety, carbamoyl, mono- or di-alkylcarbamoyl of 1 to 6 carbon atoms in each alkyl moiety, sulphamoyl, mono- or di-alkylsulphamoyl of 1 to 6 carbon atoms in each alkyl moiety, amino, mono- or di-alkylamino of 1 to 6 carbon atoms in each alkyl moiety, acylamino of 1 to 6 carbon atoms in the acyl moiety, ureido, alkoxycarbonylamino of 1 to 6 carbon atoms in the alkoxy moiety, 2,2,2-trichloroethoxycarbonylamino, aryl, heterocyclyl, hydroxy, alkoxy of 1 to 6 carbon atoms, oxo, aroyl, 2-thenoyl, alkylthio of 1 to 6 carbon atoms in the alkyl moiety, alkanesulphinyl of 1 to 6 carbon atoms in the alkyl moiety, alkanesulphonyl of 1 to 6 carbon atoms in the alkyl moiety, hydroxyimino, hydrazono, benzohydroximoyl or 2-thiophenecarbohydroximoyl; or

(e) cycloalkyl of 3 to 7 carbon atoms

and X is —O—C=C— or —S—C=C.

4,812,471

HYPOGLYCEMIC 5-(ISOXAZOLYL OR ISOTHIAZOLYL)-OXAZOLIDINE-2,4-DIONES

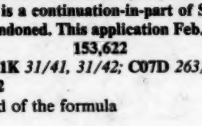
Rodney C. Schnur, Noank, assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 55,498, May 28, 1987, Pat. No. 4,753,956, which is a division of Ser. No. 783,982, Oct. 3, 1985, Pat. No. 4,689,536, which is a division of Ser. No. 574,236, Jan. 26, 1984, Pat. No. 4,565,820, which is a division of Ser. No. 380,176, May 20, 1982, Pat. No. 4,431,810, which is a division of Ser. No. 252,962, Apr. 23, 1981, Pat. No. 4,342,771, which is a continuation-in-part of Ser. No. 222,202, Jan. 2, 1981, Pat. No. 4,367,234, which is a continuation-in-part of Ser. No. 173,206, Jul. 28, 1980, abandoned. This application Feb. 8, 1988, Ser. No. 153,622

Int. Cl.[4] A61K *31/41, 31/42*; C07D *263/44, 275/02*

U.S. Cl. 514—372 **4 Claims**

1. A compound of the formula



or a pharmaceutically acceptable salt thereof; wherein

R is hydrogen, (C_1–C_4)-alkanoyl, benzoyl, (C_2–C_4)-carbalkoxy, (C_1–C_3)-alkylcarbamoyl, (C_5–C_7)-cycloalkylcarbamoyl or di(C_1–C_3)-alkylcarbamoyl;

Q is sulfur or oxygen; and

V is hydrogen or (C_1–C_3)-alkyl.

4. A method of lowering the blood glucose in a hyperglycemic mammal which comprises administering a blood glucose lowering amount of a compound of claim 1.

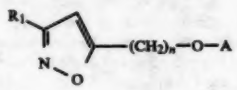
4,812,472

ISOXAZOLE COMPOUNDS AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM FOR TREATMENT AND PROPHYLAXIS OF RETROVIRUSES DISEASES

Dieter Binder, Vienna, and Franz Rovenszky, Bruck an der Leitha, both of Austria, assignors to Chemie Linz Aktiengesellschaft, Linz, Austria

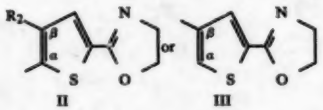
Continuation-in-part of Ser. No. 864,606, May 19, 1986, abandoned. This application Nov. 12, 1987, Ser. No. 120,264
Claims priority, application Austria, May 17, 1985, 1493/85
Int. Cl.[4] A61K *31/42*; C07D *413/14, 409/14*
U.S. Cl. 514—374 6 Claims

1. A compound of the formula



I

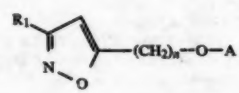
in which R_1 denotes lower alkyl, n denotes the integer 6, 7 or 8, A denotes a group of the formula



II III

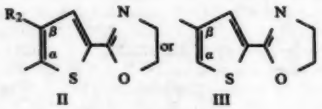
and R_2 denotes hydrogen, methyl, chlorine or bromine.

6. A pharmaceutical composition for the treatment and prophylaxis of diseases, caused by different classes of retroviruses, containing a compound for formula



I

in which R_1 denotes lower alkyl, n denotes the integer 6, 7 or 8, a denotes a group of the formula



II III

and R_2 denotes hydrogen, methyl, chlorine or bromine in an amount effective for the treatment of diseases caused by different classes of retroviruses in combination with a pharmaceutically acceptable carrier or diluent.

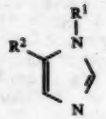
4,812,473

1,5-DISUBSTITUTED IMIDAZOLES AS INHIBITORS OF JUVENILE HORMONE

Eiichi Kuwano; Ryuko Takeya; Morifusa Eto, all of Fukuoka, and Shoji Asano, Tokushima, all of Japan, assignors to Earth Chemical Co., Ltd., Ako, Japan

PCT No. PCT/JP87/00180, § 371 Date Nov. 23, 1987, § 102(e) Date Nov. 23, 1987, PCT Pub. No. WO87/05899, PCT Pub. Date Oct. 8, 1987
PCT Filed Mar. 24, 1987, Ser. No. 141,361
Claims priority, application Japan, Mar. 24, 1986, 61-66890
Int. Cl.[4] A61K *31/415*; C07D *233/58*
U.S. Cl. 514—396 6 Claims

6. A composition for inhibiting the activity of the juvenile hormone in insects, said composition comprising a carrier and an amount effective for inhibiting said hormone of an active ingredient which is a 1,5-disubstituted imidazole represented by the formula



(I)

wherein R^1 is a lower alkyl group, a cycloalkyl group having 3 to 8 carbon atoms or a phenyl lower alkyl group, and R^2 is a 2,6-dimethyl-1,5-heptadienyl group or a 2,6-dimethylheptyl group, except for a compound wherein R^1 is a phenyl lower alkyl group and R^2 is a 2,6-dimethyl-1,5-heptadienyl group, or an acid addition salt thereof.

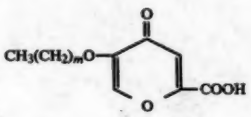
4,812,474

KOJIC ACID ETHER-ESTER DERIVATIVES

Arthur L. Campbell, Glenview, and Masateru Miyano, Northbrook, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 862,086, May 12, 1986, Pat. No. 4,735,964, which is a division of Ser. No. 641,229, Aug. 16, 1984, Pat. No. 4,603,144. This application Jan. 12, 1988, Ser. No. 142,982
Int. Cl.[4] A61K *31/35*; C07D *309/32*
U.S. Cl. 514—460 4 Claims

1. A compound of the formula



wherein m is 13 to 17, inclusive.

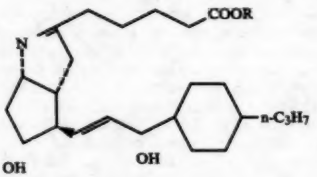
4,812,475

NEW METHOD OF TREATMENT USING PROSTAGLANDIN ANALOGUES

Yoshinobu Masuda, Osaka, Japan, assignor to Ono Pharmaceutical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 757,476, Jul. 22, 1985, abandoned. This application Nov. 25, 1986, Ser. No. 935,153
Claims priority, application Japan, Jul. 23, 1984, 59-152718
Int. Cl.[4] A61K *31/40*
U.S. Cl. 514—412 4 Claims

1. A method for the prevention or treatment of anoxia of brain cells in a patient subject to or suffering therefrom which comprises the administration of an amount effective to prevent or treat said anoxia of a cis-16,19-ethano-ω-dihomo-6,9α-nitrilo-PGI_1 alkyl ester of the general formula:



(wherein R represents an alkyl group of from 1 to 4 carbon atoms in a straight or branched chain) or a cyclodextrin clathrate thereof, or a non-toxic salt thereof.

4,812,476

PROCESS FOR STEREOSECTIVELY PREPARING OPTICALLY ACTIVE COMPOUNDS

René Imwinkelried, Fiesch, and Dieter Seebach, Zurich, both of Switzerland, assignors to Imperial Chemical Industries PLC, London, England

Filed Sep. 9, 1986, Ser. No. 906,736
Claims priority, application United Kingdom, Oct. 17, 1985, 8525666
Int. Cl.[4] C07C 59/48
U.S. Cl. 562—470 8 Claims

1. A process for stereoselectively preparing an optically active compound of the formula (I):

$$R^1R^2CHOH \quad (I)$$

wherein R_1 is an organic group selected from the class consisting of substituted C_{1-10} hydrocarbyl groups and unsubstituted C_{1-10} hydrocarbyl groups

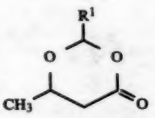
and wherein R_2 is an organic group selected from the class consisting of C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl which can be substituted by any aryl, heteroaryl and heterocyclyl groups and cyano groups and R^1 and R^2 differ from each other,

(i) reacting a compound of the formula (II) and an optically active compound of the formula (III) or a derivative thereof at ambient or elevated temperatures, in a solvent, and in the presence of a suitable catalyst:

$$R^1CHO \quad (II)$$

$$CH_3CH(OH)CH_2COOH \quad (III)$$

wherein R^1 is as above defined, to form an optically active compound of the formula (IV):



(IV)

wherein R^1 is as above defined,

(ii) reacting a compound of the formula (IV) with a compound of the formula (V) in the presence of a Lewis acid catalyst:

$$R^2—X \quad (V)$$

wherein R^2 is as above defined and X is a leaving group, to form an optically active compound of the formula (VI) or derivative thereof:

$$R^1R^2CHOCH(CH_3)CH_2COOH \quad (VI)$$

wherein R^1 and R^2 are as above defined, and

(iii) eliminating optically active compound R^1R^2CHOH from the compound of the formula (VI) by reaction of the compound fo the formula (VI) with a base, in a substantially inert solvent at a depressed temperature.

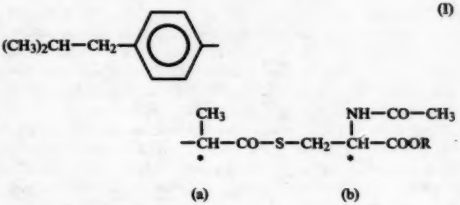
4,812,477

THIOESTERS FOR THE TREATMENT OF ISCHEMIA AND REPERFUSION SYNDROMES

Vittorio Ferrrari, Milan; Angelo Carenzi, Busto Arsizio, and Davide Della Bella, Milan, all of Italy, assignors to Zambon S.p.A., Milan, Italy

Division of Ser. No. 72,714, Jul. 13, 1987. This application Aug. 8, 1988, Ser. No. 229,280
Claims priority, application Italy, Jul. 14, 1986, 21111A/86
Int. Cl.[4] C07C 153/11; A61K 31/265
U.S. Cl. 514—513 4 Claims

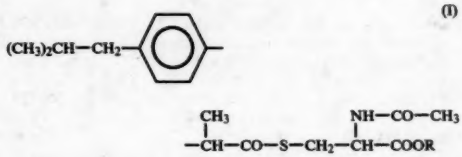
1. A compound of formula



(I)

in which R is hydrogen or C_1–C_6 alkyl group; provided however, that when R is hydrogen the C-atoms marked by (a) and (b) have (R,R) or (S,R) configuration, and the salts thereof, when R is hydrogen, with pharmaceutically acceptable bases.

4. A pharmaceutical composition for the treatment of ischemia and reperfusion syndromes consisting essentially of an effective amount of a compound of the formula:



(I)

in which R is hydrogen or a C_1–C_6 alkyl group, or a salt thereof, when R is H, with a pharmaceutically acceptable base, together with a pharmaceutically acceptable carrier.

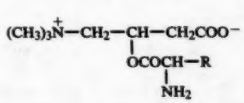
4,812,478

DERIVATIVES OF L-AMINO ACYL L-CARNITINE, PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS HAVING HEPATOPROTECTING ACTIVITY CONTAINING SAME

Maria O. Tinti; Carlo A. Bagolini; Domenico Misiti, all of Rome, and Carlo Scolastico, Milan, all of Italy, assignors to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

Filed Jun. 29, 1987, Ser. No. 67,694
Claims priority, application Italy, Jul. 2, 1986, 48217 A86
Int. Cl.[4] C07C 149/243; A61K 31/22
U.S. Cl. 514—550 12 Claims

1. L-aminoacyl L-carnitine of the formula (I)



(I)

wherein R is an alkyl radical selected from mercaptomethyl and 3-guanidinopropyl, and their pharmacologically acceptable salts.

4,812,479

METHOD FOR PREVENTING BODY FAT DEPOSITION IN MAMMALS

Ronald T. Stanko, Pittsburgh, Pa., assignor to The Montefiore Hospital Society of Western Pennsylvania, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 736,234, May 21, 1985, Pat. No. 4,645,764, which is a continuation-in-part of Ser. No. 529,403, Sep. 6, 1983, Pat. No. 4,548,937, which is a continuation-in-part of Ser. No. 346,181, Feb. 9, 1982, Pat. No. 4,415,576, which is a continuation-in-part of Ser. No. 249,812, Apr. 1, 1981, Pat. No. 4,351,835. This application Aug. 28, 1986, Ser. No. 901,402

Int. Cl.[4] A61K *31/11, 31/19*

U.S. Cl. 514—557 8 Claims

1. A method for controlling the weight in an animal having normal metabolic conditions, which comprises administering orally to an animal in need thereof a therapeutically effective amount of dihydroxyacetone to induce a weight loss or to reduce an expected weight gain from a given diet.

6. A method for increasing the glycogen store capability in the liver of an animal under normal metabolic conditions in need thereof which comprises administering a therapeutically effective amount of dihydoxyacetone over an extended period of time to increase the glycogen storage by the liver of the animal.

8. A method for increasing the glycogen store capability in the liver of an animal in need thereof, which comprises administering a therapeutically effective amount of pyruvate to increase the glycogen storage by the liver of the animal.

4,812,480

COMPOSITION FOR ADMINISTRATION THROUGH A BODY CAVITY

Osamu Shirakura, Tokyo; Hideo Kojima; Kiyohisa Ouchi, both of Kumagaya, and Sueaki Ishimaru, Gyoda, all of Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1987, Ser. No. 137,085

Claims priority, application Japan, Dec. 27, 1986, 61-309177

Int. Cl.[4] A61K *31/19, 31/20*

U.S. Cl. 514—557 1 Claim

1. A composition for administration through a mucosal membrane, which comprises from 5 to 25 parts by weight of 2',4'-difluoro-4-hydroxy-3-biphenyl carboxylic acid, from 0.1 to 15 parts by weight of a hydrogenated phospholipid selected from the group consisting of yolk and soybean hydrogenated to an iodine value of from 0 to 80, and 100 parts by weight of a fatty base selected from the group consisting of vegetable oil, animal oil, fat, mineral oil, glycerol ester of a fatty acid having from 6 to 20 carbon atoms, and a C_2–C_8 lower alkanol ester of a fatty acid.

4,812,481

SYNERGISTIC COMBINATION OF AMANTADIENE AND SELEGILINE

Dirk Reischig, Bad Homburg; Helmut Hettche, Offenbach, and Wolfgang Brade, Weiterheim, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 15, 1987, Ser. No. 38,566

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1986, 3612702

Int. Cl.[4] A61U *31/13, 31/135*

U.S. Cl. 514—647 5 Claims

1. A product containing as active substances, (1) amantadine or a salt thereof with a physiologically acceptable acid and (2) selegiline or a salt thereof with a physiologically acceptable acid, the amount of (1) and (2) being such that the product contains 0.4 to 800 parts by weight amantadine for each one part by weight selegiline and the amounts of (1) and (2) are sufficient to have a synergistic effect in treating Parkinsonism, depression, narcolepsy or cerebro-organic psychosyndrome.

4,812,482

APPLICATION OF α-[[(2-HYDROXY-1, 1-DIMETHYL-ETHYL) AMINE] METHYL] BENZENE METHANOL HYDROCHLORIDE (EL-508) AS A DRUG WITH ANTIINFLAMMATORY ACTION

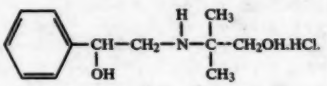
Fernando Montoro; Jose Calatayud, and Manuel Lunz, all of Madrid, Spain, assignors to Especialidades Latinas Medicamentos Universales, S.A. (Elmu, S.A.), Madrid, Spain

Filed Aug. 12, 1987, Ser. No. 84,179

Int. Cl.[4] A61K *31/135*

U.S. Cl. 514—649 7 Claims

1. A method for antiinflammatory treatment comprising: administering to a subject having inflammation, a therapeutically effective amount of α-[[(2-hydroxy-1, 1-dimethyl-ethyl) amine]methyl]benzene-methanol hydrochloride having a formula:



4,812,483

INSECTICIDAL ALKENES

Alan J. Whittle, Aldershot, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Dec. 9, 1986, Ser. No. 939,778

Claims priority, application United Kingdom, Dec. 23, 1985, 8531636; Aug. 6, 1986, 8619235

Int. Cl.[4] C07C *43/215*

U.S. Cl. 514—721 5 Claims

1. A compound of formula:

$$CXY{=}CH{-}CR^1R^2{-}CH_2OCH_2R$$

wherein X and Y are each selected from hydrogen and halogen, R^1 and R^2 are each lower alkyl of up to four carbon atoms, or together with the adjacent carbon atom form a cycloalkyl group of up to six carbon atoms, and R represents a phenoxy- or benzyl-substituted phenyl group which may optionally be substituted with fluorine.

4. An insecticidal composition comprising an insecticially effective amount of a compound according to claim 1 in association with an insecticidally inert diluent or carrier material.

4,812,484

PROCESS FOR PRODUCING EXPANDED PARTICLES OF STYRENE-ACRYLONITRILE-BUTADIENE COPOLYMER

Hiroshi Endo, and Toshihiro Gotoh, both of Mie, Japan, assignors to Mitsubishi Yuka Badische Co., Ltd., Yokkaichi, Japan

Filed Aug. 18, 1987, Ser. No. 86,580

Claims priority, application Japan, Sep. 19, 1986, 61-221610

Int. Cl.[4] C08J *9/18, 9/22*

U.S. Cl. 521—60 7 Claims

1. A process for producing expanded particles of a styrene-acrylonitrile-butadiene copolymer which comprises dispersing styrene-acrylonitrile-butadiene copolymer particles in water in a closed vessel, feeding a volatile blowing agent to the aqueous dispersion in the closed vessel, heating the aqueous dispersion to a temperature higher than the glass transition point of the copolymer particles by at least 20° C. wherein the heated aqueous dispersion is maintained at the heated temperature for a period of from 5 minutes to 5 hours to impregnate said volatile blowing agent into the copolymer particles, and opening one end of the closed vessel to release the aqueous dispersion containing the expandable copolymer particles into a low pressure zone having a pressure lower than the inner pressure of the closed vessel, wherein said expanded particles have a bulk density of from 10 to 70 g/liter.

4,812,485

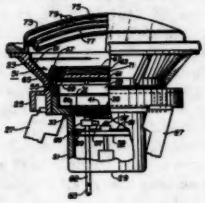
ULTRAVIOLET-RESISTANT NOISE-REDUCING MEMBER AND METHOD OF MAKING SAME

Joseph J. Piasecinski, Leola, Pa., assignor to RCA Licensing Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 14,031, Feb. 12, 1987, abandoned. This application Dec. 14, 1987, Ser. No. 132,246

Int. Cl.[4] C08J 9/00

U.S. Cl. 521—82 2 Claims



1. A noise reducing foam member which is exposed to ultraviolet radiation without degradation consisting essentially of a major proportion of a room-temperature silicon rubber and minor proportions of a room-temperature curing agent and three ultraviolet stabilizing materials consisting of about 0.8 to 1.7 weight percent carbon black, about 0.4 to 4.3 weight percent 2-(2'-hydroxy-3',5'-di-tert-amylphenyl)benzotriazole and about 4.1 to 4.3 weight percent zinc oxide.

4,812,486

ABSORBENT RESIN WITH EXCELLENT STABILITY

Yasunori Hosokawa, Funabashi, and Takatoshi Kobayashi, Utsunomiya, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Aug. 18, 1987, Ser. No. 86,476

Claims priority, application Japan, Aug. 22, 1986, 61-196874

Int. Cl.[4] C08L 77/00

U.S. Cl. 521—139 9 Claims

1. An absorbent composition having excellent stability comprising an absorbent resin and 0.01 to 30 percent by weight, based on the dried weight of said absorbent resin, of a radical chain terminator.

4,812,487

AMES-NEGATIVE DIAMINE CURATIVE FOR POLYURETHANES

Howard A. Colvin, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

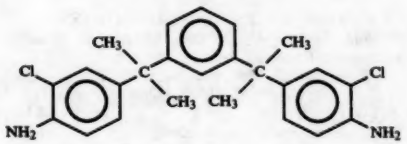
Filed Mar. 15, 1988, Ser. No. 168,282

Int. Cl.[4] G08G 18/28

U.S. Cl. 521—159 7 Claims

1. A cured polyurethane prepared by reacting an aromatic diamine of the structural formula:

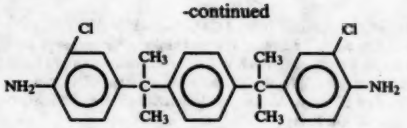
(I)



or

-continued

(II)



with (A) a mixture of an organic polyisocyanate having an isocyanate functionality of 2 to 3 with a polymeric polyol having a hydroxyl functionality of 2 to 3 and a molecular weight in the range of about 500 to about 6000 with a ratio of isocyanate groups of said polyisocyanate to hydroxyl groups of said polymeric polyol is in the range of about 1.3:1.0 to about 5:1 or (B) the reaction product of said polyisocyanate and said polymeric polyol.

4,812,488

PHOTOCOPOLYMERIZABLE COMPOSITIONS BASED ON HYDROXYL-CONTAINING ORGANIC MATERIALS AND SUBSTITUTED CYCLOALIPHATIC MONOEPOXIDE REACTIVE DILUENTS

Joseph V. Koleske, Charleston, W. Va., and George T. Kwiatkowski, Green Brook, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 464,568, Feb. 7, 1983, abandoned. This application Nov. 6, 1985, Ser. No. 794,604

The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.

Int. Cl.[4] C08G 65/14, 65/28

U.S. Cl. 522—31 9 Claims

1. A photocopolymerizable composition which, when cured is suitable for use as a pressure sensitive adhesive, comprising at least about twenty percent by weight of a polycaprolactone polyol, a cycloaliphatic monoepoxide having a vinyl substituent and a photoinitiator.

4,812,489

ULTRAVIOLET-CURING RESIN COMPOSITION

Hideo Watanabe, Yugawaramachi, and Yoshinobu Ohnshi, Odawara, both of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 749,349, Jun. 24, 1985, abandoned, and a continuation-in-part of Ser. No. 749,350, Jun. 24, 1985, abandoned. This application Jan. 28, 1988, Ser. No. 149,303

Claims priority, application Japan, Jun. 30, 1984, 59-135864; Jun. 30, 1984, 59-135865

Int. Cl.[4] C08F 2/50, 20/28, 20/36

U.S. Cl. 522—42 15 Claims

1. An ultraviolet-curing resin composition comprising an acrylic oligomer, tris(2-hydroxyethyl)isocyanurate triacrylate, a reactive diluent and a photopolymerization initiator, wherein said acrylic oligomer is an urethane acrylate obtained from diphenylmethane diisocyanate, a polytetramethylene glycol having a molecular weight of 650 to 1,300 and a monoacrylate having an hydroxy group, being selected from the group consisting of 2-hydroxyethyl acrylate and 2-hydroxypropyl acrylate, the amount of said tris(2-hydroxyethyl)isocyanurate triacrylate is 1 to 100 parts by weight per 100 parts by weight of said urethane acrylate and said reactive diluent is an acrylic monomer selected from the group consisting of 2-phenoxyethyl acrylate, dicyclopentenyl acrylate and dicyclopentenyloxyethyl acrylate, and is present in an amount between 10 and 100 parts by weight per 100 parts urethane acrylate.

4,812,490

EPOXY RESIN MOLDING COMPOUNDS

Wolfgang Kleeberg, Erlangen; Heinz Hacker, Nuremberg; Jürgen Huber, Erlangen; Dieter Wilhelm, Forchheim, and Heinz K. Laupenmühlen, Hemhofen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 14, 1987, Ser. No. 132,405

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1986, 3642782

Int. Cl.[4] C08K *7/04, 3/36*

U.S. Cl. 523—443 21 Claims

1. A molding compound for encapsulating semiconductor components comprising: an aromatic and/or heterocyclic polyepoxy resin; 1,3,5-tris(3-amino-4-alkylphenyl)-2,4,6-trioxo-hexahydrotriazine with a C_1 to C_4 alkyl radical as a hardener; and a mineral filler in powder form.

4,812,491

THERMOSETTING ACRYLIC LATEXES

Kenneth G. Hahn, Jr., Hinckley, Ohio, assignor to The Glidden Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 100,537, Sep. 24, 1987, Pat. No. 4,789,694. This application Feb. 18, 1988, Ser. No. 157,256

The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.

Int. Cl.[4] C08L *61/00*

U.S. Cl. 523—310 7 Claims

1. In a process for producing a self-curing paint coating composition, including the step of producing an emulsion polymer binder by copolymerizing ethylenically unsaturated monomers in an aqueous polymerization medium, and in the presence of surfactants and initiators, the improvement comprising:

copolymerizing ethylenically unsaturated monomers, including carboxyl or hydroxyl functional monomers and alkylol acrylamide monomer, but excluding amine monomers, to produce a functionally reactive self-curing emulsion polymer containing alkylol acrylamide groups and functional carboxyl or hydroxyl groups;

treating the self-curing emulsion polymer by contact with an ion exchange resin to remove cations from the functional emulsion polymer and produce a pH of less than 2.5, where said functionally reactive emulsion polymer is self-curing, and said paint coating is adapted to self-cure upon application to a substrate by crosslinking alkylol acrylamide groups with functional hydroxyl or carboxyl groups to produce a thermoset paint coating film.

4,812,492

AQUEOUS PIGMENT PREPARATION, AND THE USE THEREOF

Helmut Eckes, Eppstein/Taunus; Rainer Winter, Oberursel, and Albert Münkel, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 27, 1987, Ser. No. 78,216

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1986, 3625605

Int. Cl.[4] C08L *75/08, 75/06*

U.S. Cl. 523—351 5 Claims

1. An aqueous pigment preparaton which contains (a) 5 to 80% by weight of a finely-divided inorganic and/or organic pigment having an average particle size of 50–300 nm, (b) 5 to 80% by weight of an aqueous polyurethane dispersion of a product of the polyaddition of a polyester or polyether diol and bishydroxymethylpropanoic acid with an aliphatic or aromatic diisocyanate, the product being dispersed in water with neutralization and reacted with a polyamine with chain extension to form a urea polymer, (c) 2 to 80 percent by weight of water and (d) 0 to 50% by weight of an organic solvent.

4,812,493

DUAL CURE RATE WATER-BASED COATING COMPOSITIONS

Lowell O. Cummings, San Anselmo, Calif., assignor to Adhesive Coatings Co., San Mateo, Calif.

Filed Apr. 10, 1987, Ser. No. 36,988

Int. Cl.[4] C08L *61/32, 61/30, 63/00*

U.S. Cl. 523—412 29 Claims

1. A water-based composition which, in a rapid cure stage will form an initial protective film and in a slower curing stage will of either of these which retain free aldehyde groups, and an aqueous component selected from the group consisting of (I) epoxy resin emulsions, (II) an aqueous component other than an epoxy resin emulsion and selected from the group consisting of synthetic latexes stable at about pH 7 or less, low molecular weight resin emulsions, epoxy ester emulsions, water emulsified alkyds and cationic-, anionic-, or non-ionic asphalt emulsions, and (III) mixtures of (I) and (II); and

said Part B component comprising the non-gel reaction product of a urea-formaldehyde ether monomer and a polyamine chosen from the group consisting of primary and secondary amines.

11. The water-based composition of claim 1 wherein the synthetic latex is a vinyl acrylic latex.

4,812,494

STABILIZED STYRENE POLYMER

Hideo Nagasaki, Osaka; Shinichi Yachigo, Toyonaka; Tamaki Ishii, Suita; Masakatsu Yoshimura, Sakai; Yukoh Takahashi, Toyonaka, and Hiroki Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 4, 1987, Ser. No. 128,874

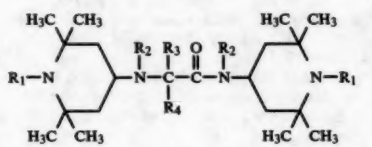
Claims priority, application Japan, Dec. 19, 1986, 61-304826

Int. Cl.[4] C08H *5/34*

U.S. Cl. 524—91 14 Claims

1. A stabilized styrene polymer composition comprising

(A) a hindered piperidine compound represented by the formula



wherein

R_1 is a hydrogen atom or an alkyl group having 1 to 3 carbon atoms,

R_2 is a hydrogen atom or an alkyl group having 1 to 12 carbon atoms, and

R_3 and R_4 are each independently an alkyl group having 1 to 4 carbon atoms;

(B) a benzotriazole compound selected from the group consisting of 2-(2-hydroxy-5-methylphenyl)benzotriazole and 2-(2-hydroxy-3-tert-butyl-5-methylphenyl)-5-chlorobenzotriazole; and

(C) a styrene polymer.

4,812,495

ANAEROBIC ADHESIVE COMPOSITIONS

I. Daniel Sand, Jonesborough, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 19, 1987, Ser. No. 110,158

Int. Cl.[4] C08G *81/00, 83/00*

U.S. Cl. 524—37 29 Claims

1. An adhesive composition comprising:

(A) at least one carboxylated cellulose ester having an acid number greater than or equal to about 5 and less than or equal to about 50, a peroxide value of from about 0.05 to

about 2, and from about 0.4 to about 4.0% by weight total carboxyl groups;

(B) at least one acrylate monomer; and

(C) at least one hydroquinone-based stabilizer,

The components (A), (B), and (C) being of a chemical nature and present in quantities and proportions such that when the final formulation is exposed to the atmosphere, said formulation will remain fluid and not cure for at least 8 hours at ambient temperature and that, when placed between surfaces which exclude the atmosphere from said formulation, said formulation will cure to form an effective adhesive bond between the surfaces within 24 hours at ambient temperature.

4,812,496

LATEX BASED ADHESIVE COMPOSITION FOR PAPERBOARD AND CORRUGATED BOARD

Arthur N. Leadbetter, and James G. Galloway, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 27, 1987, Ser. No. 7,223

Int. Cl.[4] C08L 89/00; C09D 3/06; C09J 3/06

U.S. Cl. 524—47 **8 Claims**

1. An aqueous adhesive comprising:

(a) starch; and

(b) a polymer latex prepared in the presence of ammonium hydroxide.

4,812,497

ANAEROBICALLY CURABLE COMPOSITION HAVING A GOOD STABILITY

Shuji Mochizuki, Hachioji, Japan, assignor to Three Bond Co. Ltd., Tokyo, Japan

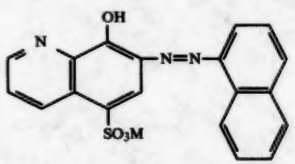
Continuation of Ser. No. 840,314, Mar. 14, 1986, abandoned. This application Nov. 4, 1987, Ser. No. 119,234

Claims priority, application Japan, Mar. 15, 1985, 60-51815

Int. Cl.[4] C08K 5/34; C08F 4/04

U.S. Cl. 524—87 **9 Claims**

1. An anaerobically curable composition having a good stability and suitable for use, primarily as an adhesive, which comprises a compound which is a radically polymerizable acrylate and/or methacrylate monomer terminally having one or more polymerizable ethylenically double bonds, a naphthyl azoxine having a structure of



wherein M is H or Na, an inorganic filler selected from the group consisting of heavy calcium carbonate, alumina, titanium oxide, potassium titanate, talc and crystallite, in an amount at least equal to ten percent of the total weight, and not in excess of the amount which would unsuitable degrade the stability of the composition.

4,812,498

POLYCARBONATE RESIN COMPOSITIONS HAVING IMPROVED RESISTANCE TO DETERIORATION WHEN EXPOSED TO LIGHT AND CONTAINING ALKYLIDENE BIS(BENZOTRIAZOLYL PHENOLS)

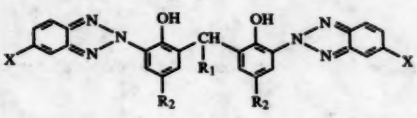
Yutaka Nakahara, Okegawa; Atsushi Nishimura, Washinomiya, and Toshio Nakajima, Urawa, all of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

Filed Dec. 22, 1986, Ser. No. 945,733

Int. Cl.[4] C08K 5/34

U.S. Cl. 524—91 **26 Claims**

1. A polycarbonate resin composition having improved resistance to deterioration when exposed to light, comprising a polycarbonate resin and an alkylidene bis(benzotriazolyl phenol) having the formula:



wherein:

R_1 is selected from the group consisting of hydrogen and alkyl having from one to about eleven carbon atoms;

R_2 is selected from the group consisting of alkyl having from one to about twelve carbon atoms; and arylalkyl having from seven to about eighteen carbon atoms; and

X is selected from the group consisting of hydrogen; halogen; alkyl having from one to about twelve carbon atoms; aryl alkyl having from seven to about eighteen carbon atoms; alkoxy having from one to about twelve carbon atoms; phenoxy; arylalkoxy having from seven to about eighteen carbon atoms; and phenyl.

4,812,499

SELF-EXTINGUISHING COMPOSITIONS OF THERMOPLASTIC POLYMERS

Gioacchino Cipriani, San Donato Milanese, and Gianluigi Landoni, Milan, both of Italy, assignors to Enichem Sintesi S.p.A., Palermo, Italy

Filed Mar. 20, 1986, Ser. No. 841,591

Claims priority, application Italy, Mar. 29, 1985, 20155 A/85

Int. Cl.[4] C08K 13/02, 3/32, 5/51; C08L 23/02

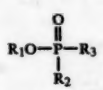
U.S. Cl. 524—96 **7 Claims**

1. Self-extinguishing compositions of thermoplastic polymers comprising, in mixture, a thermoplastic polymer and a mixture of additives conferring self-extinguishing characteristics to the same polymer, formed by:

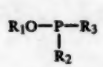
ammonium phosphate or ammonium polyphosphate:

wherein p varies within the range of from 1 to about 1000; and by:

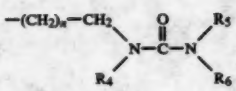
phosphorus-containing compounds definable by means of the general formulae:



or

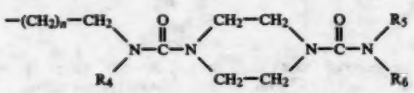


or mixtures thereof or condensation products thereof formed solely from condensation reactions among compounds of formula (IIa), of (IIb) or of (IIa) and (IIb), wherein R_1 is a group which is represented by the following formula:



(c)

or a group which is represented by the following formula:

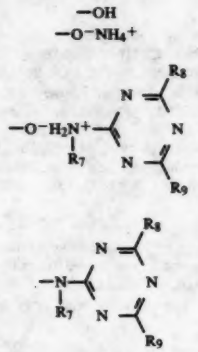


(d)

wherein, in said (c) and (d) formulae: n varies within the range of from 1 to 5; R_4, R_5, R_6 are independently selected among hydrogen (up to a maximum of two hydrogen atoms), C_2–C_6 alkyl or C_2–C_6 hydroxyalkylene groups; or R_5 and R_6, in (c) and (d) formulae, or R_4 and R_6, limited to (c) formula, when considered jointly, can form a $—(CH_2)_m$alkylene bridge, wherein m has such a value as to give rise to the formation of five-, or sixmembered ring structures or R_5 and R_6, when considered jointly, can form a $—CH_2—CH_2—O—CH_2—CH_2$ oxydiethylene bridge;

R_2 and R_3 are the same as $—OR_1$;

or they are selected among the following groups:



(e)

(f)

wherein in said (e) and (f) formulae:

R_7 is either hydrogen or a C_1–C_6 alkyl group;

R_8 and R_9 are groups independently selected among amino, hydroxy, C_1–C_6 alkyl, C_1–C_6 oxyalkyl and mono- and di-amino-C_1–C_6 alkyl group;

the additives (I) and (IIa) and/or (IIb) can moreover be present in overall amounts of from 20 to 35 parts by weight per each 100 parts by weight of thermoplastic polymer, the weight ratio between additive (I) and additive (IIa) and/or additive (IIb) can moreover vary within the range of from 0.45/1 to 3.5/1.

4,812,500

POLYOLEFIN COMPOSITIONS FOR WATER PIPES AND FOR WIRE AND CABLE COATINGS

Earl E. Hayden, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 30, 1987, Ser. No. 103,247

Int. Cl.[4] C08K *5/53, 5/52, 5/34, 5/25*

U.S. Cl. 524—99 **25 Claims**

8. A composition for use in a cool water carrying system consisting of a polymeric blend of:

(a) about 93 to about 99.5 percent by weight of an isotactic alpha olefin polymer having 2–6 carbon atoms;

(b) about 0.05 to about 0.5 percent by weight of N,N'-bis(2,2,6,6-tetramethyl-4-piperidinyl)-1,6-hexane diamine polymer with 2,4,6-trichloro-1,3,5-triazine and 2,4,4-trimethyl-1,2-pentanamine;

(c) about 0.05 to about 1.1 percent by weight of a hindered phenolic thermal stabilizer having a molcular weight above 530 and selected from the group consisting of: 1,3,5-trimethyl-2,4,6-tris(3,5-di-tert-butyl-4-hydroxy-benzyl)benzene, octadecyl 3,5-di-tert-butyl-4-hydroxyhydrocinnamate, tetrakis[methylene(3,5-di-tert-butyl-4-hydroxy-hydro-cinnamate)]methane, 1,3,5-tris(4-tert-butyl-3-hydroxy-2,6-dimethylbenzyl)-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione, bis-[3,3-bis(4'hydroxy-3'tert-butyl-phenyl)-butanoic acid]-glycolester, tris(3,5-di-t-butyl-4-hydroxybenzyl)isocyanurate and mixtures thereof;

(d) from about zero to about 0.5 percent by weight of a nucleating agent;

(e) about zero to about 4 percent by weight of a pigment;

(f) about zero to about 3 percent by weight of a filler; and

(g) about 0.1 to about 3 percent by weight of a chelating agent selected from the group comprising: 2,2'-oxamidobis-ethyl 3-(3,5-di-t-butyl-4-hydroxy-phenyl)-propionate, N'N'-bis[3-(3,5-di-tert-butyl-4-hydroxy-phenyl)]propionyl hydrazine, calcium bis(mono-ethyl(3,5-di-tert-butyl-4-hydroxy-benzyl)phosphonate, and tris(2-t-butyl-4-(2-methyl-4-hydroxy-5-t-butylphenylthio)-5-methyl)phenylphosphite.

4,812,501

1,3,2-OXAZAPHOSPHOLIDINE STABILIZERS

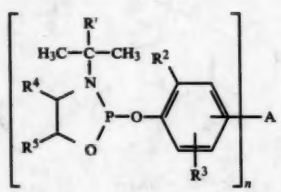
Paul A. Odorisio, Edgewater, N.J.; Stephen D. Pastor, Yonkers, N.Y., and James L. Hyun, Danbury, Conn., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 9,430, Feb. 2, 1987, Pat. No. 4,751,319, which is a continuation-in-part of Ser. No. 855,059, Apr. 23, 1986, abandoned. This application Mar. 16, 1988, Ser. No. 168,816

Int. Cl.[4] C08K *5/51, 5/13, 5/34*

U.S. Cl. 524—117 **16 Claims**

1. A composition of matter comprising an organic polymer, oil, fat or wax subject to oxidative, thermal and actinic degradation stabilized with an effective stabilizing amount of a compound of the formula



wherein

R' is alkyl of 1 to 5 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl, phenyl substituted by alkyl of 1 to 18 carbon atoms, aralkyl of 7 to 9 carbon atoms or said aralkyl substituted by alkyl of 1 to 18 carbon atoms;

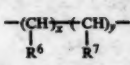
R^2 is alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl, phenyl substituted by alkyl of 1 to 18 carbon atoms, aralkyl of 7 to 9 carbon atoms or said aralkyl substituted by alkyl of 1 to 18 carbon atoms;

R^3, R^4 and R^5 independently are hydrogen or R^2;

R^4 and R^5 together with the ring carbon atoms may also form a cycloalkyl ring of 5 to 6 carbon atoms,

n is 1–5;

A is hydrogen, a direct bond, dan n-valent aliphatic hydrocarbon of 1 to 18 carbon atoms, an n-valent aromatic or aromatic aliphatic hydrocarbon of 6 to 20 carbon atoms, a group of the formula



—SR^9, —OR^{10} or —$NR^{11}R^{12}$, or —S—,

or —O— when n=2,

wherein

R^6 and R^7 are independently a sustituent defined under R^3,

R^8 is R^3, an n-valent aliphatic hydrocarbon of 1 to 10 carbon atoms or an n-valent aromatic or aromatic aliphatic hydrocarbon of 6 to 10 carbon atoms,

R^9, R^{10}, R^{11} and R^{12} are independently a substituent defined under R^2, and

x and y are independently 0, 1 or 2.

4,812,502

OLIGOMER FLAME-RETARDING ADDITIVE, PROCESS FOR ITS PREPARATION AND ITS USE FOR ENDOWING A LINEAR POLYESTER WITH SELF-EXTINGUISHING CHARACTERISTICS

Gioacchino Cipriani, Milan, and Armando Mariano, Matera, both of Italy, assignors to Enichem Sintesi, S.p.A., Palermo, Italy

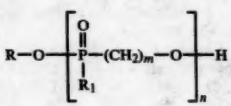
Filed Jul. 7, 1987, Ser. No. 70,355

Claims priority, application Italy, Jul. 23, 1986, 21228 A/86

Int. Cl.[4] C07F 9/38, 9/40; C08K 5/53; C08G 79/04

U.S. Cl. 524—125 **28 Claims**

1. A method of providing a linear polyester with flame-retarding properties comprising added a flame-retarding effective amount of a flame-retarding additive comprising a compound of the formula



wherein:

R is selected from a hydrogen atom and a linear or branched chain alkyl group having from 1 to 6 carbon atoms;

R_1 is selected from unsubstituted phenyl; phenyl substituted with at least one substituent selected from an alkyl group having from 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms and a halogen atom; unsubstituted naphthyl; naphthyl substituted with at least one unsubstituent selected from an alkyl group having from 1 to 4 carbon atoms, an alkoxy group having from 1 to 4 carbon atoms, and a halogen atom; and an alkyl group having from 1 to 4 atoms;

m is an integer of 1, 2 or 3; and

n is an integer of from 2 to 50.

4,812,503

PAINT COMPOSITION CONTAINING A VOLATILE CORROSION INHIBITOR

Maurice S. Baseman, Pittsburgh, Pa., assignor to Ronco Laboratories, Inc., Pittsburgh, Pa.

Filed Dec. 11, 1987, Ser. No. 131,657

Int. Cl.[4] C08K 5/20

U.S. Cl. 524—226 **5 Claims**

1. A novel paint composition comprising (1) an organic solid film-forming component selected from the group consisting of an alkyd ester and a polyurethane resin, (2) an organic volatile corrosion inhibitor obtained from the reactants consisting of dicyclohexylamine and an organic acid having from seven to eight carbon atoms, (3) an organic solvent and (4) a pigment.

4,812,504

COMPOSITIONS AND EXTRUDED ARTICLES COMPROMISING POLYOLEFIN, POLYAMIDE AND FATTY ACID AMIDE

Tien-Kuei Su, Belle Mead, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 19, 1987, Ser. No. 87,078

Int. Cl.[4] C08K 5/20; C08L 23/18, 23/06, 63/00

U.S. Cl. 524—229 **4 Claims**

1. A film produced from a blend comprising at least 50 weight percent of a solid polymeric polyolefin selected from the group consisting of linear homopolymers of ethylene and of propylene and linear copolymers of ethylene and olefins of C_4 and higher; at least 5 weight percent of polymeric polyamide selected from the class of polyamides known as nylons; and, N,N'-ethylene bis-oleamide fatty acid amide in an amount sufficient to increase the surface smoothness of an extrudate prepared from the same proportions of said polyolefin and said polyamide without said fatty acid amide.

4,812,505

TREE RESISTANT COMPOSITIONS

Barry Topcik, Bridgewater, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 134,859, Dec. 18, 1987, which is a continuation of Ser. No. 50,397, May 18, 1987, abandoned. This application Mar. 1, 1988, Ser. No. 156,599

Int. Cl.[4] C08K 5/06

U.S. Cl. 524—377 **12 Claims**

1. A heat and water tree resistant composition comprising:

(a) a copolymer of ethylene and at least one alpha-olefin having 4 to 8 carbon atoms, said copolymer having a density equal to or less than 0.91 gram per cubic centimeter; and

(b) a polyethylene glycol having a molecular weight in the range of about 1000 to about 20,000 in an amount of about 0.1 to about 20 percent by weight based on the weight of the copolymer.

4,812,506

AMINO METHYL PROPANOL BLOCKED AROMATIC SULFONIC ACID

Thomas C. Gilmer, Media, Pa., and David C. K. Chang, Birmingham, Mich., assignors to E. I Du Pont De Nemours and Company, Wilmington, Del.

Filed May 15, 1987, Ser. No. 52,495

Int. Cl.[4] C08L 61/00

U.S. Cl. 524—512 **5 Claims**

1. A coating composition comprising about 40–85% by weight of a film forming binder and about 15–60% by weight of an organic liquid carrier and containing in addition about 0.1–6.0% by weight of a curing catalyst consisting essentially of an adduct of an aromatic sulfonic acid reacted with 2-amino-2-methyl-1-propanol and wherein the film forming binder comprises sabout 40–90% by weight, based on the weight of the binder, of an acrylic polymer containing reactive hydroxyl, glycidyl, amide groups or mixtures of these groups and about 10–60% by weight of an amino resin crosslinking agent.

4,812,507

REINFORCED RESINOUS COMPOSITION COMPRISING POLYCYANO ARYLENE ETHER

Shigeru Matsuo; Tomoyoshi Murakami; Thoru Bando, and Kikuo Nagatoshi, all of Chiba, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

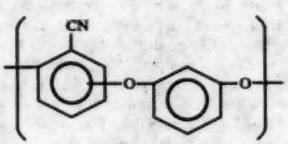
Division of Ser. No. 27,629, Mar. 18, 1987. This application Nov. 9, 1987, Ser. No. 118,526

Claims priority, application Japan, Mar. 25, 1986, 61-64746; Apr. 10, 1986, 61-81066; Jun. 23, 1986, 61-144917; Jun. 23, 1986, 61-144918; Jun. 24, 1986, 61-146038; Jul. 1, 1986, 61-152626

Int. Cl.[4] C08L 71/04

U.S. Cl. 524—611 2 Claims

1. A reinforced resinous composition comprising 40 to 95% by weight of a polycyanoaryl ether containing a recurring unit represented by the formula:



(I)

and having a reduced viscosity (ηsp/c) of 0.3 dl/g or more at 60° C. in a solution of a concentration of 0.2 g/dl in p-chlorophenol as a solvent, as a main component, and 5 to 60% by weight of a fibrous reinforcing material.

4,812,508

MODIFIED ROSIN SOAPS FOR ACRYLIC EMULSIONS

Joseph M. Makhlouf, Mars; Michael M. Chau, Gibsonia, and James R. Freid, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 9, 1985, Ser. No. 764,029

Int. Cl.[4] C08L 93/00

U.S. Cl. 524—764 3 Claims

1. A process for preparing an acrylic latex comprising polymerizing an ethylenically unsaturated monomer in an aqueous medium containing an emulsifier which is a modified rosin soap comprising an esterification product of a Diels-Alder adduct of:

(I) a monomeric rosin and

(II) an alpha, beta - ethylenically unsaturated dicarboxylic acid or anhydride thereof; the esterified product is at least partially neutralized with an amine or ammonia.

4,812,509

ESTERS AND POLYESTERS FROM CYCLOPENTADIENYLETHANOL AND BIS(2-HYDROXYETHYL)DICYCLOPENTADIENE

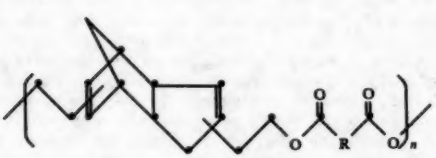
Jerome L. Stavinoha, and Anthony W. McCollum, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 28, 1987, Ser. No. 101,474

Int. Cl.[4] C08G 63/18; C08K 5/10

U.S. Cl. 524—484 9 Claims

1. A polyester of the formula:



wherein R represents an aliphatic or aromatic, branched or unbranched hydrocarbon, and n is a number of at least 1.

4. A coating composition comprising a polyester as claimed in claim 1 and a suitable solvent.

4,812,510

SMALL PARTICLE SIZE LATEX BASED ON VINYL ACETATE POLYMERS

Gerald W. Barnett, Middleburg Heights, and Tien T. Chen, Brunswick, both of Ohio, assignors to The Glidden Company, Cleveland, Ohio

Filed Apr. 17, 1986, Ser. No. 853,054

Int. Cl.[4] C08L 43/00

U.S. Cl. 524—807 18 Claims

1. A paint coating composition containing a polymeric binder of a stable, clean, water dispersed vinyl acetate copolymer latex comprising on a polymeric solids weight basis:

the vinyl acetate copolymer comprising copolymerized monomers of 60 to 100 weight parts vinyl acetate, 0.05 to 15 weight parts of an ionic comonomer selected from a sulfonate salt of an ethylenically unsaturated monomer or a phosphate salt of 2-hydroxyethyl methacrylate, and 0 to 40 weight parts of other ethylenically unsaturated monomer, where said monomers are copolymerized simultaneously by aqueous emulsion copolymerization in the presence of 0.05 to 20 weight parts of an alpha-olefin sulfonate salt anion surfactant having the structure:

$$R—CH=CH—CH_2—SO_3\,M$$

where R is an aliphatic carbon chain and M is selected from sodium, potassium or ammonium;

said vinyl acetate copolymer having an average polymer particle size between about 400 A and 1000 A.

4,812,511

ETHYLENICALLY-UNSATURATED ETHERS OF ALKENYL PHENOLS AS REACTIVE DILUENTS FOR BISMALEIMIDES

Linda A. Domeier, Windsor, Calif., assignor to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 885,723, Jul. 15, 1986, abandoned. This application Dec. 14, 1987, Ser. No. 132,597

Int. Cl.[4] C08K 3/34, 3/04; C08F 26/06

U.S. Cl. 524—850 8 Claims

1. A bismaleimide resin formulation comprising a bismaleimide and, as a reactive diluent, an ether of eugenol selected from the group consisting of the allyl ether of eugenol, the vinylbenzyl ethers of eugenol and the di-eugenol ethers of glycols.

4,812,512

SUPPORTS AND THEIR USE

Jean Buendia, Le Perreux Sur Marne, and Jeanine Nierat, Suresnes, both of France, assignors to Roussel Uclaf, France

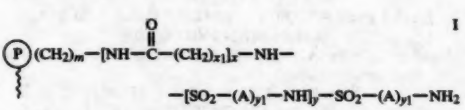
Filed Jun. 26, 1986, Ser. No. 878,611

Claims priority, application France, Jun. 27, 1985, 85 09786

Int. Cl.[4] C12P 18/34, 18/38

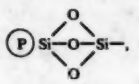
U.S. Cl. 525—54.11 11 Claims

1. A support of the formula



I

wherein (P) is a material selected from the group consisting of functionalized glass micropellets, silica functionalized by aminoalkyl trialkoxysilane capable of producing for



Kieselguhr, polytetrafluoroethylene, cellulose and metallic oxides, m is an integer from 1 to 20, A is selected from the group consisting of alkyl of 1 to 20 carbon atoms, saturated cycloalkyl of 3 to 12 carbon atoms, phenyl and 5 to 6 member heterocycles, x and y are an integer from 0 to 20, x_1 is an integer from 1 to 20 and y_1 is an integer from 0 to 10.

4,812,513
EPOXY RESIN COMPOSITION AND PRODUCTION PROCESS THEREOF

Toshiyuki Hirose, Otake, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

PCT No. PCT/JP87/00393, § 371 Date Feb. 16, 1988, § 102(e) Date Feb. 16, 1988, PCT Pub. No. WO87/07900, PCT Pub. Date Dec. 30, 1987

PCT Filed Jun. 17, 1987, Ser. No. 169,199

Claims priority, application Japan, Jun. 17, 1986, 61-139277; Oct. 13, 1986, 61-241400

Int. Cl.[4] C08G *81/02*; C08L *63/00*

U.S. Cl. 525—65 **18 Claims**

1. An epoxy resin composition comprising:

(A) 1 to 40 parts by weight of a modified low molecular weight polyolefin obtained by graft copolymerizing at least one graft monomer selected from the group consisting of:

(i) at least one unsaturated carboxylic acid derivative selected from the group consisting of unsaturated carboxylic acids and anhydrides thereof and esters thereof,

(ii) at least one aromatic vinyl compound, and

(iii) at least one nitrile compound, onto a low molecular weight polyolefin having an intrinsic viscosity [η] of 0.01 dl/g to 1.0 dl/g, as measured in decalin at a temperature of 135° C.,

(B) 99 to 60 parts by weight of an epoxy resin (the total amount of (A) an (B) is 100 parts by weight), and

(C) a hardener for the epoxy resin.

4,812,514
POLYMER BLENDS

Duane B. Priddy, and John R. Schroeder, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 21, 1987, Ser. No. 136,049

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—67 **9 Claims**

1. A polycarbonate resin composition comprising:

(a) 40 to 80% of a polycarbonate resin;

(b) 20 to 60% by weight of a diene-vinyl aromatic-vinyl cyanide terpolymer; and

(c) 1 to 10% by weight of at least one polyetherpolycarbonate-polyether ABA-type triblock copolymer.

4,812,515
AGEING-RESISTANT THERMOPLASTIC MOULDING MATERIALS OF GOOD IMPACT STRENGTH

Hans-Jürgen Kress, Pittsburgh, Pa.; Christian Lindner; Wolfgang Grape, both of Cologne, Fed. Rep. of Germany; Horst Peters, Leverkusen, Fed. Rep. of Germany; Jochen Schoeps, and Dieter Wittmann, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 16, 1987, Ser. No. 97,550

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1986, 3631539

Int. Cl.[4] C08F *8/00*

U.S. Cl. 525—69 **4 Claims**

1. Themoplastic moulding materials containing:

A. 5 to 98 parts by weight, of one or more thermoplastic polycarbonates,

B. 2 to 70 parts parts by weight, of one or more graft polymers of

B.1 5 to 90 parts by weight, of a mixture composed of

B.1.1 50 to 95 parts by weight of styrene, α-methylstyrene, styrene substituted in the nucleus, methyl methacrylate or mixtures thereof, and

B.1.2 50 to 5 parts by weight of acrylonitrile, methacrylonitrile, maleic anhydride, N-substituted maleimide or mixtures thereof, grafted onto

B.2 95 to 10 parts by weight, of a rubber having a core/shell structure and consisting of a core a. constituting a crosslinked silicone rubber, and of a shell b. constituting a crosslinked alkyl acrylate rubber, the ratio by weight of the core having an average particle diameter (d_{50}) of 0.05 to 10 μm, and

C. 0 to 80 parts by weight, of a thermoplastic copolymer formed from

C.1 50 to 95 parts by weight of styrene, α-methylstyrene, styrene substituted in the nucleus, methyl methacrylate or mixtures thereof, and

C.2 50 to 5 parts by weight of acrylonitrile, methacrylonitrile, maleic anhydride, N-substituted maleimide or mixtures thereof.

4,812,516
POLYMER COMPOSITION

Tetsuro Maeda, Ichihara, Japan, assignor to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 943,696, Dec. 19, 1986, Pat. No. 4,774,291. This application Jun. 1, 1988, Ser. No. 200,909

Claims priority, application Japan, Dec. 26, 1985, 60-292193; Jan. 8, 1986, 61-1539; Jan. 8, 1986, 61-1540

Int. Cl.[4] C08L *9/00, 51/04, 55/02, 25/04*

U.S. Cl. 525—83 **13 Claims**

1. A thermoplastic resin composition comprising from 0.5 to 50% by weight of the polymer composition obtained by mixing, in an emulsion state,

(A) from 20 to 90% by weight (as solid content of polymer) of an emulsion of polymer component (A) which is a polymer of a vinyl monomer and has a glass transition temperature of higher than 20° C., a gel content of not higher than 10% and a solubility parameter of from 8.0 to 11.0 $(cal/cc)^{\frac{1}{2}}$ and which has a weight average molecular weight, based on polystyrene, of at least 1.5×10^5, and

(B) from 10 to 80% by (as solid content of polymer) of an emulsion of polymer component (B) which is a homopolymer of an acrylate monomer, a copolymer of acrylate monomers or a copolymer of an acrylate monomer with other copolymerizable monomer and has a glass transition temperature of not higher than 20° C., a gel content of not higher than 70% and a solubility parameter of from 8.4 to 9.8 $(cal/cc)^{\frac{1}{2}}$, and separating the polymer from the emulsion mixture, and from 50 to 99.5% by weight of an elastomer-containing styrene resin comprising an elastomer component and a resin component having a glass transition temperature of higher than 20° C., with a covalent

substance of the elastomer and resin components being present at the interface between the elastomer component constituting a dispersed phase and the resin component constituting a continuous phase.

4,812,517

DISPERSANTS RESISTANT TO COLOR CHANGE

Michael W. J. West, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 28, 1987, Ser. No. 138,039
Int. Cl.[4] C08F *8/00, 293/00*
U.S. Cl. 525—94 **11 Claims**

1. A block copolymer having at least one A segment and at least one B segment, each segment having a molecular weight of at least about 500 and the backbones of which consist essentially of at least one polymerized methacrylate or acrylate ester, at least 20% of the acrylic moieties of the A segment having bonded thereto a moiety derived from a carboxylic acid, an amide or sulfonamide which is a substituent of a phenyl aromatic; the phenyl aromatic having another substituent which is a conjugating group; the phenyl aromatic having no nitrogen, thiol, or OH group directly bonded to an aromatic ring, and wherein the B segment contains less than 20% of the acid, amide or sulfonamide moieties present in the A segment.

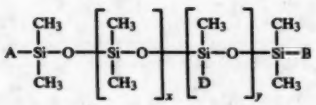
4,812,518

POLYESTER GROUP CONTAINING POLYSILOXANES FOR LACQUERS AND MOLDING COMPOSITIONS

Karlheinz Haubennestel, Wesel, and Alfred Bubat, Wesel-Bislich, both of Fed. Rep. of Germany, assignors to BYK-Chemie GmbH, Wesel, Fed. Rep. of Germany

Filed Sep. 30, 1986, Ser. No. 913,302
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1985, 3535283
The portion of the term of this patent subsequent to Sep. 23, 2003, has been disclaimed.
Int. Cl.[4] C08F *8/00*; C08G *77/04*
U.S. Cl. 525—100 **22 Claims**

1. A lacquer or molding composition comprising at least one resin component and an effective anti-adhesive chaacteristic producing and lubricity increasing amount of a polyester-containing polysiloxane corresponding to the average formula



(I)

wherein

A, B and D each represent $-CH_3$ or a group —Z—R—Q, in which

Z represents an alkylene group having from 1 to 11 carbon atoms, $-(CH_2)_2SCH_2-$ or $-(CH_2)_3NHCO-$;

R represents an aliphatic, cycloaliphatic or aromatic group containing at least 3 carboxylate ester linkages and having an average molecualr weight Mn of from 300 to 3,000, and

Q represents an unsaturated reactive group capable of reacting chemically with a resin component of the composition;

x is a number from 4 to 150;

y is a number from 1 to 6, and

wherein an average molecule contains at least one —Z—R—Q group, and the ratio of the number of groups —Z—R—Q to the number x is from 1:3 to 1:30.

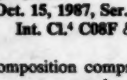
4,812,519

CROSSLINKING OF VINYL SILANE AND AZIDOSILANE MODIFIED THERMOPLASTIC POLYMERS BY MOISTURE

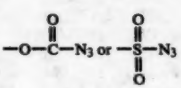
Paul C. Gillette, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Oct. 15, 1987, Ser. No. 108,526
Int. Cl.[4] C08F *8/00*
U.S. Cl. 525—106 **13 Claims**

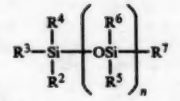
1. A polymer composition comprising (i) a thermoplastic polymer of number average molecular weight of 20,000 or greater, (ii) from about 0.1 to about 4 weight percent of an azidosilane having the formula



where R is an organic radical; X is a radical selected from the group consisting of halo, alkoxy, aryloxy, aliphatic oxycarbonyl, cycloaliphatic oxycarbonyl, and aromatic oxycarbonyl radicals; T is a radical selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl, and aralkyl radicals; a is an integer from 1 to 3; b is an integer from 0 to 2; c is an integer from 1 to 10; d is an integer from 1 to 3; a+b+d equals 4; and Z is selected from



and (iii) from about 0.1 to about 4 weight percent of an olefinically unsaturated silicon compound having the formula



where n is an integer from 0 to 4; one of R^2, R^3, R^4, R^5, R^6, and R^7 is an alkenyl radical and the other R^2, R^3, R^4, R^5, R^6, and R^7 radicals are selected from the group consisting of lower alkyl, aryl, aralkyl and lower alkoxy radicals.

4,812,520

METHOD FOR THE PREPARATION OF NOVEL POLYACETYLENE-TYPE POLYMERS

John M. Zeigler, Albuquerque, N. Mex., assignor to The Unites States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 760,433, Jul. 30, 1985, abandoned. This application Nov. 9, 1987, Ser. No. 118,076
Int. Cl.[4] C08L *83/00*; C08F *30/08*
U.S. Cl. 525—101 **6 Claims**

1. A process for preparing a polymer containing repeating units of —(XC=CR_4)— and —(C(Si(CH_3)$_3$)=CH—

comprising reacting a first soluble polymer with a reagent effective to cause electrophillic or nucleophilic substitution of $R_1R_2R_3Si-$ groups thereof by X,

said first polymer having a molecular weight (M_n)≧about 10,000 and being a polymer of one or more monomers of the formula R—C≡C—R_4 wherein R is $R_1R_2R_3$ in which each of $R^1R_2R_3Si$ is C_{1-4}(n- or sec-)-alkyl; C_{2-4}-alkenyl; C_{6-14}-aryl; C_{7-17}-heteroaryl; C_{7-17}-alkaryl; C_{7-17}-aralkyl; C_{3-13}-cycloalkyl; C_{2-4}-(n- or sec-)-alkyl in which one CH_2 group is replaced by —O—, —S—, —COO—, or —OOC—; C_{6-14} aryl or heteroaryl in which one aryl CH is substituted by —O—, —S—, —COO—, or —OOC—; H, or groups recited for R_1, R_2, and R_3; R_4 is H or one of

the groups recited for R_1, R_2, and R_3, except C_{2-4}-alkenyl, with the provisos that R and R_4 must not both be H at the same time and that the combination of R and R_4 be sterically compatible.

4,812,521

EPOXY RESINS MODIFIED WITH N-R-[(OXY OR THIO)METHYL]ACRYLAMIDE TERPOLYMERS

Richard A. Markle, Columbus, Ohio, assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Sep. 21, 1987, Ser. No. 99,253

Int. Cl.[4] C08L *11/00, 9/02, 33/26, 63/02*

U.S. Cl. 525—116 **5 Claims**

1. An impact modified thermoset resin composition, said resin selected from the group consisting of epoxy resins and epoxy novolak resins, comprising:

said thermoset resin and an N-(R-thiomethyl) acrylamide-nitrile random terpolymer which is dispersible in said resin at about less than 30° C., said N-(R-thiomethyl) acrylamide-nitrile terpolymer provided in an amount effective to provide impact modification of said thermosetting resin, wherein said terpolymer is the reaction product of N-(R-thiomethyl) acrylamide, a rubber formable monomer selected from the group consisting of isoprene, butadiene, alkyl esters of acrylic acid, alkyl esters of methacrylic acid and chloroprene, and a nitrile monomer selected from the group consisting of acrylonitrile and methacrylonitrile.

4,812,522

MOLECULARLY MISCIBLE BLENDS OF POLYKETONE WITH POLYVINYL PHENOL

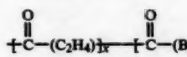
Dale L. Handlin, Jr., Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 4, 1987, Ser. No. 129,124

Int. Cl.[4] C08L *23/08, 25/08, 25/18*

U.S. Cl. 525—153 **8 Claims**

1. A molecularly miscible blend of (a) a linear alternating polymer of carbon monoxide and an ethylenically unsaturated hydrocarbon having a melting point in the range of 175° F. to 300° F., a crystallinity in the range of 25% to 80%, and said polymer is of the formula:



wherein B is the moiety of an ethylenically unsaturated hydrocarbon of at least 3 carbon atoms polymerized through the ethylene unsaturation and the ratio y:x is no more than 0.5 with (b) polyvinyl phenol wherein said components (a) and (b) are blended in relative proportions by weight within a range of from 1:99 and 99:1 parts based on 100 parts of the combined components (a) and (b).

4,812,523

HIGH SOLIDS COATINGS WITH REACTIVE DILUENT

Perry A. Tomsp, Medina, Ohio, assignor to The Glidden Company, Cleveland, Ohio

Filed Jan. 25, 1988, Ser. No. 147,440

Int. Cl.[4] C08L *61/00*

U.S. Cl. 525—162 **8 Claims**

1. A non-aqueous, high solids coating composition comprising on a polymeric solids weight basis:

between 10% and 50% acrylic polymer having a number average molecular weight measured by GPC between 500 and 2500 and a hydroxyl number between 50 and 200;

between 10% and 60% polyester polymer having a number average molecular weight measured by GPC between 250 and 2,000 and a hydroxyl number between 115 and 285;

between 5% and 60% hydroxyl functional urethane diluent produced by reacting one equivalent of a primary or a secondary amine with between 0.8 and 1.5 equivalents cyclic carbonate to produce said diluent having a number average molecular weight as measured by GPC between 150 and 1000 and a hydroxyl number between 100 and 750; and

between 20% and 40% of a coreactive amine derivative selected from an aminoplast resin or a glycoluril adapted to coreact with the acrylic polymer, the polyester polymer, and the hydroxyl functional urethane diluent.

4,812,524

POLYUREA/POLYURETHANE ADHESIVE COMPOSITIONS

Jamil Baghdachi, Wayne, Pa., assignor to Pony Industries, Inc., New York, N.Y.

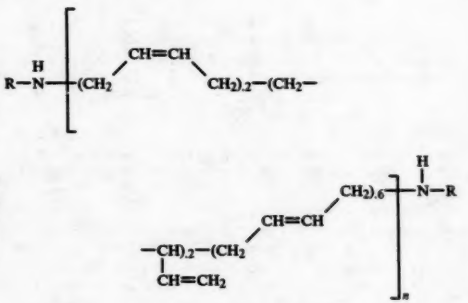
Filed May 8, 1986, Ser. No. 860,972

The portion of the term of this patent subsequent to Jan. 26, 2005, has been disclaimed.

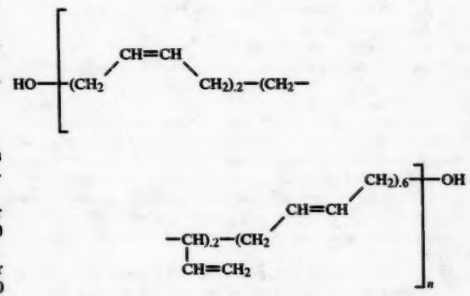
Int. Cl.[4] C08G *18/62*

U.S. Cl. 525—194 **10 Claims**

1. A heat-curable two-component polyurea/polyurethane adhesive composition comprising the reaction product of (a) a blend of from about 5 to about 95 parts by weight based on the total weight of the blend of an amine terminated polybutadiene having the formula:



wherein R is hydrogen, a straight or branched chain alkyl group containing from 1 to 10 carbon atoms or a substituted or an unsubstituted aryl or aralkyl group containing one or more benzenoid rings which may be fused or joined by single valency bonds and n is an integer of from about 5 to about 1500, and from about 95 to 5 parts by weight based on the total weight of the blend of a polyhydroxybutadiene homopolymer having the formula:



wherein n is as hereinabove described, with (b) an aliphatic or aromatic di-or polyisocyanate.

4,812,525

POLYBUTADIENE RUBBER COMPOSITION

Noboru Oshima, Suzuka; Yoshishige Chikatsu; Toshiaki Fukuhori, both of Yokkaichi; Tatsuro Hamada, and Tatsuo Fujimaki, both of Higashimurayama, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd. and Bridgestone Corporation, both of Tokyo, Japan

Filed Jul. 16, 1987, Ser. No. 74,172
Claims priority, application Japan, Sep. 8, 1986, 61-209616
Int. Cl.[4] C08F 8/42
U.S. Cl. 525—232 8 Claims

1. A rubber composition containing, as a rubber component, 20-100% by weight of (A) polybutadiene polymerized by using a lithium initiator and having the following physical properties (i) to (v):

(i) The molecular weight distribution of Mw/Mn is 1.4 to 3.0 in which Mw and Mn are a weight average molecular weight and a number average molecular weight, respectively;

(ii) A polymer component having the molecular weight being not more than 10^5 when calculated as polystyrene is from 7 to 25%;

(i) The content of bound vinyl groups is from 10 to 25%;

(iv) The content of tin atoms bonded to the polymer by tin-carbon bonds is not less than 50 ppm; and

(v) Mooney viscosity (ML_{1+4}, 100° C.) is from 20 to 70, and 80 to 0% by weight of (B) another rubber component.

4,812,526

IMPACT POLYPROPYLENE

Mahmoud R. Rifi, Kendall Park, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 8, 1987, Ser. No. 59,053
Int. Cl.[4] C08L 23/12, 23/20, 23/08
U.S. Cl. 525—240 3 Claims

1. A molded product exhibiting a blush of less than about 0.4 inch per 10 pounds and a Gardner Impact of at least about 175 inch-pounds comprising:

(i) isotactic polypropylene; and

(ii) a copolymer of ethylene and 1-butene, said copolymer (a) having a density of about 0.87 to about 0.90 gram per cubic centimeter and a crystallinity in the range of about 20 to about 35 percent by weight based on the weight of the copolymer and (b) being present in the composition in the range of about 20 to about 50 percent by weight based on the weight of the polypropylene.

4,812,527

RUBBER COMPOSITION FOR TIRE TREADS CONTAINING DICARBOXYLIC ACID DIESTER COUPLED BLOCK POLYMERS

Hiroyoshi Takao, Chiba; Nabuyuki Yoshida, Ichihara; Akio Imai, Ichihara; Mitsuji Tsuji, Ichihara, and Yuichi Saito, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Sumitomo Rubber Industries, Ltd., Kobe, both of, Japan

Filed Oct. 27, 1987, Ser. No. 112,989
Claims priority, application Japan, Oct. 30, 1986, 61-258899
Int. Cl.[4] C08F 297/04
U.S. Cl. 525—250 5 Claims

1. A rubber composition comprising a rubber component containing at least 20% by weight of a block copolymer, said block copolymer being a branched block copolymer consisting essentially of a block A and a block B, obtained by copolymerization of an aromatic vinyl compound and a conjugated diene compound in the presence of an organolithium initiator in a hydrocarbon solvent and having the following conditions (A) to (E);

(A) the block A is a block of a polymer of which the content of the aromatic vinyl compound is not more than 5% by weight and the 1,2-bonding content in the conjugated diene component is not less than 10% by weight;

(B) the block B is a block of a copolymer of which the content of the aromatic vinyl compound is from 25 to 50% by weight and the 1,2-bonding content in the conjugated diene component is not less than 10% by weight;

(C) the content of block A is from 20 to 80% by weight;

(D) the average content of the aromatic vinyl compound is from 5 to 30% by weight and the average 1,2-bonding content in the conjugated diene component is from 20 to 60% by weight; and

(E) at least 40% by weight of the whole polymer chains is modified with a dicarboxylic acid diester.

4,812,528

POLYMER HYDROGENATION PROCESS

Garry L. Rempel, Waterloo; Navroz A. Mohammadi, Sarnia, and Rajeev Farwaha, Kitchener, all of Canada, assignors to University of Waterloo, Waterloo, Canada

Continuation-in-part of Ser. No. 70,023, Jul. 6, 1987. This application Jun. 1, 1988, Ser. No. 200,954
Int. Cl.[4] C08F 8/04
U.S. Cl. 525—338 9 Claims

1. In a process for the selective hydrogenation of the carbon-carbon double bonds in a copolymer of a conjugated diene and at least one copolymerizable monomer, the improvement which comprises effecting said hydrogenation in the presence of at least one divalent ruthenium complex selected from the group consisting of:

(a) a ruthenium complex of the general formula:

$$RuT(CO)(NO)(Z)_2 \quad (1)$$

wherein T is a halogen atom and Z is a $—PR_1R_2R_3$ group in which R_1, R_2 and R_3 may be the same or different and are selected from alkyl and aryl groups,

(b) a ruthenium complex of the general formula:

$$RuT(NO)(Z)_2 \quad (2)$$

wherein T and Z are as defined above,

(c) a ruthenium complex of the general formula:

$$RuH(NO)(Z)_3 \quad (3)$$

wherein Z is as defined above, and

(d) a ruthenium complex of the general formula:

$$Ru(NO)_2(Z)_2 \quad (4)$$

wherein Z is as defined above.

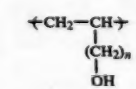
4,812,529

POLYALCOHOL HOMOPOLYMERS

Tze-Chiang Chung, Bridgewater, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 5, 1987, Ser. No. 520
Int. Cl.[4] C08F 8/00
U.S. Cl. 525—326.1 2 Claims

1. A polyalcohol homopolymer having the formula:



wherein n is about 3 to about 10, wherein said polyalcohol homopolymer has a partial crystalline molecule structure of a syndiotactic configuration and a number average molecular weight of at least 30,000 and said polyalcohol homopolymer has high thermal stability with a major decomposition temperature above 450° C., said polyalcohol homopolymer being formed by reacting a polyborane homopolymer with a $NaOH/H_2O_2$ solution of about 0° to about 25° C.

4,812,530

POLYETHER-POLYCARBONATE-POLYETHER TRIBLOCK COPOLYMERS

Duane B. Priddy, Midland, Mich., and Alan Letton, Missouri City, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 28, 1987, Ser. No. 138,265
Int. Cl.[4] C08L 71/02
U.S. Cl. 525—409 18 Claims

1. A triblock copolymer of the ABA type wherein the A segments comprise monohydroxy polyethers having the formula $R^1(—O—CHR^2—CR^3H)_nOH$ wherein R^1 is a hydrocarbon radical having form 1 to 20 carbon atoms and free of aliphatic unsaturation, R^2 and R^3 are independently hydrogen, methyl and eithyl and the sum of the carbon atoms in R^2 and R^3 is from 0 to 2, and n is 1 to 50 and the B segments comprises polycarbonates.

4,812,531

THERMOSETTABLE POLYMERS OR PREPOLYMERS PREPARED FROM HETEROCYCLIC MATERIALS HAVING ALKYL SUBSTITUENTS, MONO- OR DIANHYDRIDES, ETHYLENICALLY UNSATURATED MATERIALS AND A HYDROXIDE, CARBONATE OR BICARBONATE OF A METAL OF GROUPS I-A OR II-A

Duane S. Treybig, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 754,696, Jul. 15, 1985. This application Feb. 28, 1986, Ser. No. 834,252
Int. Cl.[4] C08G 69/48
U.S. Cl. 525—419 6 Claims

1. A process for preparing an alkali or alkaline earth metal carboxylic acid salt of an ethenyl (vinyl) terminated prepolymer or polymer which comprises

(A) reacting

(1) the product resulting from reacting in a mixture of a solvent and dehydration agent

(a) at least one heterocyclic material having one or more rings therein, at least one nitrogen atom in a ring and at least two substituent groups which have at least one reactive hydrogen atom attached to a carbon atom which is attached to a heterocyclic ring,

(b) at least one cycloaliphatic or aromatic dicarboxylic acid monoanhydride or tetracarboxylic acid dianhydride; and

(c) at least one material containing a polymerizable ethylenically unsaturted group;

at a temperature in the range of about 50° to about 140° C. for about 1 to about 64 hours; with

(2) an aqueous or alcoholic solution of a hydroxide, carbonate or bicarbonate of an alkali metal or an alkaline earth metal at a temperature in the range of about 0° to about 220° C. for about 10 minutes to 24 hours; and

(B) recovering the alkali or alkaline earth metal carboxylic acid salt of the ethenyl terminated prepolymer or polymer.

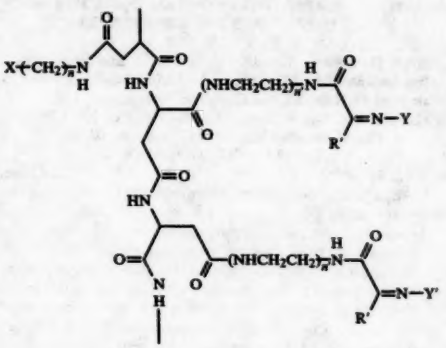
4,812,532

SOLID PHASE OXIME REAGENT

Mark L. Stolowitz, Long Beach, Calif., assignor to Bio-Affinity Systems, Inc., Torrance, Calif.

Filed Jul. 29, 1987, Ser. No. 79,258
Int. Cl.[4] C08G 69/48
U.S. Cl. 525—420 18 Claims

1. A solid phase oxime composition having the general formula I:



where X is particulate silica gel or controlled pore glass; n is 3 or 4, n' is 1–6; R' is an electron withdrawing group; and Y and Y' are selected from OH, OCOR", OSO_2R" or OCO_2R", where R" is a chromophore, fluorophore and electrophore.

4,812,533

HYDROXY ACID ESTERIFIED POLYOLS

Dominic Simone, Lincroft, and Melvin Brauer, East Brunswick, both of N.J., assignors to CasChem, Inc., Bayonne, N.J.

Filed Mar. 25, 1987, Ser. No. 30,402
Int. Cl.[4] C08C 19/00, 19/20; C08F 8/00
U.S. Cl. 525—437 46 Claims

1. A low viscosity polyol which comprises a high viscosity or solid resin containing at least two hydroxyl groups at least one of which is esterified with ricinoleic acid, hydroxystearic acid or mixtures thereof to form a polyol having a lower viscosity than the resin without reducing the hydroxy functionality below that of the resin.

2. A low viscosity polyol which comprises a high viscosity or solid resin containing at least two hydroxyl groups at least one of which is esterified with a ricinoleate ester, a hydroxystearate ester or mixtures thereof by a transesterification reaction to form a polyol having a lower viscosity than the resin without reducing the hydroxy functionality below that of the resin.

4,812,534

IMPACT TOUGHENED POLYESTER NYLON BLENDS

Dale M. Blakely, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 4, 1988, Ser. No. 179,366
Int. Cl.[4] C08L 67/02, 77/02
U.S. Cl. 525—425 11 Claims

1. A molding composition, comprising:

(i) 99-50 weight percent of a polymer blend comprising,

(a) 5-95 weight percent nylon 6; and

(b) 95-5 weight percent of a polyester copolymer comprising terephthalic acid and glycol monomer units, said glycol comprising 1,4-cyclohexylenedimethanol and C_{2-6} alkylene glycol monomer units; and

(ii) 1-50 weight percent of a polyesteramide comprising C_{6-15} alkylene dicarboxylic acid, diamine and glycol monomer units, wherein said glycol is a C_{2-6} alkylene glycol or an alicyclic glycol having 5–8 ring carbon atoms, and said diamine is a C_{2-8} alkylene diamine, an alicyclic diamine having 5–8 ring carbon atoms or a diazacycloalkane comprising a 5–8 membered ring.

4,812,535

COATING COMPOSITION CONTAINING A HYDROXY FUNCTIONAL EPOXY-POLYESTER GRAFT COPOLYMER

Andrew H. Dervan, Grosse Pointe Farms, and Panagiotis I. Kordomenos, Mt. Clemens, both of Mich., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 798,044, Nov. 14, 1985, Pat. No. 4,708,995.
This application Sep. 3, 1987, Ser. No. 93,230
Int. Cl.[4] C08G *63/06, 63/08*
U.S. Cl. 525—450 13 Claims

1. An organic solvent based, thermosetting coating composition comprising:

(I) hydroxy functional epoxy-polyester graft copolymer having a number average molecular weight ($\overline{M}_n$) of between about 2,000 and about 20,000, said copolymer being the product of polymerization of lactone monomers in the presence of hydroxy functional epoxy ester resin precursor having a number average molecular weight ($\overline{M}_n$) of between about 1,000 and about 4,000, said precursor being the reaction product of (1) a chain extended product of diepoxide with diphenol and (2) acid component in chain termination reaction, said acid component comprising primary hydroxy functional acid, and reacted in about a 1 to 1 equivalent ratio to the chain extended product, wherein said polymerization of said lactone monomers is carried out at a temperature between about 50° C. and about 300° C. and the polymerization reaction mixture comprises between about 10 and about 80 weight percent said hydroxy functional epoxy ester resin precursor and between about 90 and about 20 weight percent said lactone monomers; and

(II) blocked polyisocyanate crosslinking agent comprising at least two isocyanate groups which have been blocked by reaction with an active hydrogen bearing blocking agent, said blocked polyisocyanate crosslinking agent being included in an amount such that upon de-blocking of the blocked isocyanate groups thereof at the cure temperature of the composition, said crosslinking agent provides between about 0.5 and about 1.6 reactive isocyanate groups per reactive group on said hydroxy functional epoxy-polyester graft copolymer.

4,812,536

SELECTIVE PARA-ETHYLATION OF TOLUENE WITH MAGNESIUM COMPOUND-IMPREGNATED, CRYSTALLINE, GALLOSILICATE BASED, MOLECULAR SIEVE CATALYST COMPOSITIONS

Richard E. DeSimone, Lisle, and Lori B. Lane, Wheaton, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 901,613, Aug. 29, 1986, abandoned.
This application Jun. 3, 1988, Ser. No. 202,210
Int. Cl.[4] C07C *2/68*
U.S. Cl. 585—467 2 Claims

1. A gas-phase process to form para-ethyltoluene in greater than 95 weight percent isomeric purity comprising contacting toluene and ethylene at a temperature between about 250° C. to about 400° C. and in a mol ratio, toluene to ethylene, of about 2 to about 20 with a magnesium compound-impregnated catalyst composition containing between about 4 and about 20 weight percent magnesium comprising a crystalline silica molecular sieve, essentially aluminum-free and containing between about 0.3 and about 4 weight percent nonexchangeable gallium, composited in alumina or silica such that the composite contains between about 20 to about 80 percent by weight of said sieve, said sieve providing an X-ray pattern comprising the following X-ray diffraction lines and assigned strengths:

Interplanar Spacing d, Å	Assigned Strength	Interplanar Spacing d, Å	Assigned Strength
11.10 ± 0.20	VS	4.25 ± 0.10	VW

-continued

Interplanar Spacing d, Å	Assigned Strength	Interplanar Spacing d, Å	Assigned Strength
9.96 ± 0.20	MS	3.84 ± 0.10	MS
6.34 ± 0.20	W	3.71 ± 0.10	M
5.97 ± 0.20	W	3.64 ± 0.10	W
5.55 ± 0.20	W	2.98 ± 0.10	VW

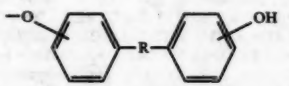
4,812,537

COATING COMPOSITION FOR METALS

Tetsu Maki, Hiratsuka, Japan, assignor to Kansai Paint Co., Ltd., Amagasaki, Japan

Filed May 20, 1987, Ser. No. 51,694
Claims priority, application Japan, May 22, 1986, 61-118041
Int. Cl.[4] C08L *63/02;* C08G *59/06, 59/14*
U.S. Cl. 525—488 11 Claims

1. A coating composition for metals which contains: (A) a modified bisphenol-based epoxy resin prepared by introducing at least one of a functional group represented by the following formula:



wherein R represents a bivalent aliphatic hydrocarbon residual group having 1 to 4 carbon atoms into a molecular terminal of an esterified resin formed by esterifying a stoichiometric excess of a bisphenol-based epoxy resin having an epoxy equivalent of 180 to 1,500 with a saturated dibasic acid and having a number-average molecular weight of 2,900 to 3,800; and (B) a phenol resin and/or an amino resin.

4,812,538

(ACYLTHIOPROPYL)PHENOLS

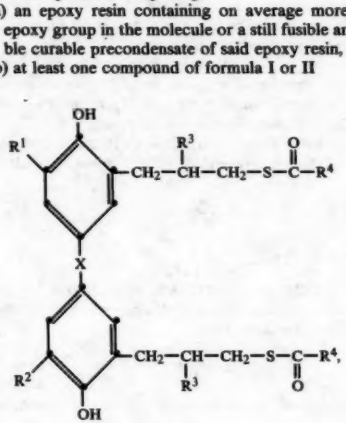
Hans Lehmann, Aesch, and Abdul-Cader Zahir, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 823,230, Jan. 28, 1986, Pat. No. 4,694,096.
This application Jun. 29, 1987, Ser. No. 67,198
Claims priority, application Switzerland, Feb. 1, 1985, 452/85
Int. Cl.[4] C08G *59/62*
U.S. Cl. 525—505 3 Claims

1. A composition comprising,

(a) an epoxy resin containing on average more than one epoxy group in the molecule or a still fusible and/or soluble curable precondensate of said epoxy resin, and

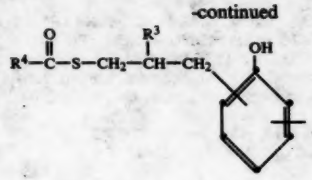
(b) at least one compound of formula I or II

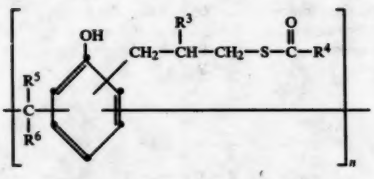


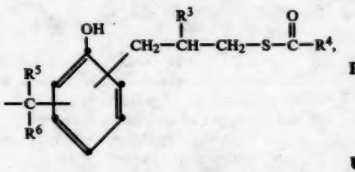
(I)

-continued

(II)







wherein R^1 and R^2 are each independently of the other hydrogen, C_1–C_{18}alkyl, cyclohexyl, phenyl, benzyl or tolyl, or are a $—CH_2—CHR^3—CH_2—S—CO—R^4$ radical, R^3 is hydrogen or methyl, R^4 is C_1–C_{18}-alkyl, cyclohexyl, phenyl, benzyl or tolyl, X is $—CR^5R^6—$, —S—, —SO—, $—SO_2—$or $—(CH_3)C[—(CH_2)_m—COOR^7]—$, in which R^5 and R^6 are each independently of the other hydrogen or C_1–C_6alkyl, R^7 is C_1–C_{18}alkyl, m is 1 or 2 and n is an integer from 1 to 10.

4,812,539

POLYARYLENE SULFIDE PREPARATION IN TITANIUM REACTION VESSEL WITH TWO DISTINCT TEMPERATURE RANGES

Yo Iizuka; Takao Iwasaki; Takayuki Katto, and Zenya Shiiki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 31, 1987, Ser. No. 79,999

Claims priority, application Japan, Aug. 4, 1986, 61-182989

Int. Cl.[4] C08G 75/16

U.S. Cl. 526—62 **3 Claims**

1. A process for producing polyarylene sulfide having a melt viscosity of not less than 1000 poise, as measured at 310° C. under a shear rate of 200 sec^{-1}, which comprises subjecting an alkali metal sulfide, a dihalo aromatic compound and a tri-or higher polyhalo aromatic compound in an amount of from 0.01 to 1 mol % based on the dihalo aromatic compound to dehalogenation and sulfidation reaction at a temperature of from 240° to 270° C. in the presence of water in amount of from 0.5 to 5 mol per 1 kg of an aprotic organic polar solvent until the conversion of said dihalo aromatic compound reaches 70 to 98 mol %, thereby forming a polyarylene sulfide prepolymer having a melt viscosity of from 5 to 300 poise, as measured at 310° C. under a shear rate of 200 sec^{-1}, adding water to the resultant reaction mixture containing the polyarylene sulfide prepolymer so that from 6 to 15 mol of water is present per 1 kg of said solvent, and then continuing the reaction at a temperature of from 240° to 290° C., in which the reaction comprising said two steps is conducted for from 2 to 6 hours, and wherein the reaction is conducted in a reaction apparatus in which at least the parts in contact with the reaction solution are constituted with titanium material.

4,812,540

PREPARATION OF POLYMERS OF MONOALLYLAMINE AND DIALLYLAMINE DERIVATIVES WITH AZO CATALYST

Kenji Kageno; Toshio Ueda, and Susumu Harada, all of Koriyama,, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Continuation of Ser. No. 854,059, Apr. 18, 1986, abandoned, which is a continuation of Ser. No. 662,998, Oct. 19, 1984, abandoned. This application May 12, 1987, Ser. No. 51,181

Claims priority, application Japan, Oct. 21, 1983, 58-197112

Int. Cl.[4] C08F 2/16, 2/14

U.S. Cl. 526—218.1 **2 Claims**

1. A process for preparing a copolymer which comprises: copolymerizing monoallylamine hydrochloride and diallylamine hydrochloride in a ratio of from 9:1 to 0.5:1 in water in the presence of from 0.1 to 10%, based on monomer, of 2,2'-diamidinyl-2,2'-azopropane hydrochloride at a temperature of from 30° to 100° C.

4,812,541

HIGH PERFORMANCE PRESSURE-SENSITIVE ADHESIVE POLYMERS

Prakash Mallya, Pasadena; Colin Smith, Glendale, and Sebastian S. Plamthottam, Pasadena, all of Calif., assignors to Avery International Corporation, Pasadena, Calif.

Filed Dec. 23, 1987, Ser. No. 138,722

Int. Cl.[4] C08F 26/08

U.S. Cl. 526—264 **19 Claims**

1. A pressure-sensitive adhesive comprising a copolymer comprising on a copolymerized basis from about 55 to about 85% by weight of a monomer selected from the group consisting of alkyl acrylate esters and alkyl methacrylate esters containing from 4 to about 12 carbon atoms in the alkyl group and mixtures thereof, from 0 to about 35% by weight of an alkyl acrylate or methacrylate ester containing less than 4 carbon atoms in the alkyl group, from 0.01 to about 2% by weight of a glycidyl monomer, from about 1 to about 10% by weight of an N-vinyl lactam, and from 0 to about 15% by weight of an unsaturated carboxylic acid, said copolymer having a weight average molecular weight of at least about 200,000 and a glass transition temperature less than about −15° C.

4,812,542

COPOLYMERS HAVING O-NITROCARBINOL ESTER GROUPS AND PREPARATION THEREOF

Reinhold Schwalm, Wachenheim, and Horst Binder, Lampertheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 8, 1987, Ser. No. 130,291

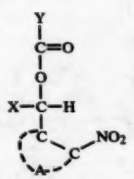
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1986, 3642184

Int. Cl.[4] C08F 26/06, 20/34

U.S. Cl. 526—265 **5 Claims**

1. A copolymer which contains as copolymerized units (a) from 5 to 50 mol % of one or more compounds of the formula (I)

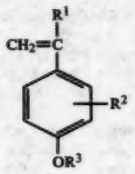
(I)



where A is an aromatic or heteroaromatic, substituted or unsubstituted ring system of 5 to 14 ring members, X is hydro-

gen, alkyl of 1 to 8 carbon atoms, or substituted or unsubstituted aryl or aralkyl, and Y is an ethylenically unsaturated radical of 2 to 6 carbon atoms,

(b) from 95 to 50 mol % of one or more compounds of the formula (II)



(II)

where R^1 is hydrogen or methyl, R^2 is hydrogen, halogen or alkyl of 1 to 6 carbon atoms, R^3 is hydrogen, alkyl of 1 to 6 carbon atoms, acetyl, benzoyl, C_1–C_6-alkylsilyl, C_1–C_6-alkoxysilyl or tert.-butoxycarbonyl, and (c) from 0 to 30 mol % of one or more further olefinically unsaturated, copolymerizable organic compounds, other than (a) and (b), whose homopolymers are transparent within the wavelength region from 250 to 400 nm, with the proviso that the percentages mentioned under (a) to (c) add up to 100.

4,812,543

CO-POLYMER-BOUND AMINE ANTIOXIDANTS

Albert S. Matlack, Hockessin, and Martin J. Paisner, Wilmington, both of Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Mar. 1, 1988, Ser. No. 162,446

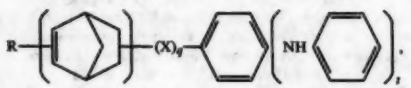
Int. Cl.[4] C08F *10/14*

U.S. Cl. 526—281 **4 Claims**

1. A ring-opening metathesis catalyst polymerizable composition comprising:

(a) at least one ring-opening metathesis catalyst polymerizable norbornene-type monomer, and

(b) at least one ring-opening metathesis catalyst polymerizable amine antioxidant comonomer having the general formula:



in which R represents hydrogen or a haloalkyl, and where X represents a direct bond or a multivalent organic radical selected from a straight-chain or branched C_1 to C_{20}-alkyl, C_2 to C_{20}-alkenyl, C_7 to C_{20}-aralkyl, C_7 to C_{20}-aralkenyl group, or —OR'—,

—NH_2—, —R'—NH—, —Ph—R'—NH—, —Ph—R'—O—, —SO_2—, —SO_2—R'—O—, —SO_2R'NH—, groups in which R' represents a straight chain or branched C_1 to C_{20}-alkyl, C_2 to C_{20}-alkenyl, C_7 to C_{20}-aralkyl, or C_7 to C_{20}-aralkenyl group, and where q is a positive integer or zero, and t is a positive integer from 1 to 2, wherein the amount of amine antioxidant comonomer from part (b) ranges from about 0.005 parts by weight to about 20 parts by weight per 100 parts polymerizable monomer from part (a).

4,812,544

METHOD OF PRODUCING POLYMERS OF AMIDO-SULFONIC ACID MONOMERS WITH HIGH ENERGY AGITATORS

Thomas M. Sopko, Painesville, and Richard E. Lorentz, Euclid, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

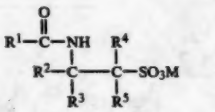
Filed Sep. 10, 1985, Ser. No. 774,269

Int. Cl.[4] C08F *2/00, 28/02*

U.S. Cl. 526—73 **31 Claims**

1. A method for producing an amido-sulfonic acid or salt containing homopolymer; comprising the steps of;

adding an amido-sulfonic acid or salt containing monomer to a vessel, said amido-sulfonic acid or salt containing monomer having the formula:



where R^1 is a hydrocarbyl having from 1 to about 11 carbon atoms, wherein R^2, R^3, R^4, and R^5, independently, is hydrogen or a hydrocarbyl with the proviso that the total number of carbon atoms of R^2, R^3, R^4, and R^5 is 8 carbon atoms or less wherein M is H, ammonium, a metal cation or mixtures thereof;

polymerizing said salt amido-sulfonic acid or salt containing monomer in the presence of a high energy mechanical mixing, and

conducting the final stage of said polymerization at a temperature of from about 200° F. to below the degradation temperature of said monomer.

4,812,545

PROCESS FOR THE PREPARATION OF SUBSTITUTES FOR OPTICAL GLASSES AND POLYMERIZABLE LIQUID COMPOSITION SUITABLE TO THAT PURPOSE

Florenzo Renzi, Gorgonzola; Franco Rivetti, Schio; Ugo Romano, Vimercate, and Claudio Gagliardi, San Donato Milanese, all of Italy, assignors to Enichem Sintesi S.p.A., Palermo, Italy

Filed May 15, 1986, Ser. No. 863,526

Claims priority, application Italy, May 15, 1985, 20718 A/85

The portion of the term of this patent subsequent to Jun. 4, 2002, has been disclaimed.

Int. Cl.[4] C08F *26/06, 18/24*

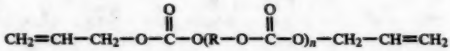
U.S. Cl. 526—230.5 **23 Claims**

9. A process for the preparation of substitutes for optical glasses comprising:

combining the following components into a polymerizable composition,

from 10 to 50% by weight of component (A) which is a monomer product of a reaction between diallylcarbonate and diethyleneglycol in a molar ratio of about 12:1;

from 20 to 70% by weight of component (B) which is an oligomer product of a reaction between diallylcarbonate and diethyleneglycol in a molar ratio of about 2:1, said oligomer product being defined by the following formula:



wherein R is the radical of diethylene glycol and n has a value, or an average value, of from 2 to 5;

from 5 to 50% by weight of component (c) which is a monomer product of tris(hydroxyethyl)isocyanurate tris(allylcarbonate) resulting from a reaction of diallyl-

carbonate with tris(hydroxyethyl)isocyanurate in a molar ratio of higher than about 10:1; and

a free-radical initiator in an amount of from 1 to 6% by weight relative to the total weight of said (A), (B), and (C) components;

pouring said polymerizable composition into moulds shaped corresponding to an article which is to be manufactured;

maintaining said polymerizable composition at a temperature lower than the decomposition temperature of said free-radical initiator; and

polymerizing said polymerizable composition at a temperature of from 30° to 120° C., for a timer period of from 3 to 100 hours.

15. The process according to claim **9**, wherein said free-radical initiator is selected from a member of the group consisting of diisopropylperoxydicarbonate, dicyclohexylperoxydicarboante, disec.butylperoxydicarbonate, dibenzoylperoxide and tert-butylperbenzoate.

4,812,546

NEW COPOLYMERS OF ALPHA-CYANOACRYLATES AND ACRYLATES, THEIR PREPARATION AND THEIR USE

Kurt P. Meurer, Koenigswinter; Helmut Waniczek, Cologne; Christian Ohm, Leverkusen, and Josef Witte, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

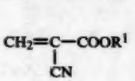
Filed Sep. 25, 1987, Ser. No. 101,075

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1986, 3633711; Nov. 11, 1986, 3638387

Int. Cl.[4] C08F *20/42*

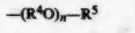
U.S. Cl. 526—297 **10 Claims**

1. Copolymers obtained by the copolymerization of α-cyanoacrylates corresponding to formula (I)



wherein

R^1 stands for C_1–C_8 alkyl which may be preferably substituted with a group corresponding to formula (III)



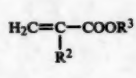
wherein

R^4 stands for C_1–C_8-alkylene,

R^5 stands for hydrogen or a C_1–C_8-alkyl and

n stands for an integer with a value from 1 to 10, preferably an integer with a value from 1 to 4,

with acrylates corresponding to Formula (II)

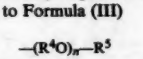


wherein

R^2 denotes hydrogen or C_1–C_6 alkyl and

R^3 denotes C_1–C_8 alkyl

which may be preferably substituted with a group corresponding to Formula (III)



wherein

R^4 stands for C_1–C_8 alkylene,

R^5 stands for hydrogen or a C_1–C_8 alkyl and

n stands for an integer with a value from 1 to 10, preferably an integer with a value from 1 to 4.

4,812,547

PRESSURE SENSITIVE ADHESIVES COMPRISING ETHYLENE VINYL ACETATE DIOCTYL MALEATE TERPOLYMERS

Paul R. Mudge, Somerville, N.J., assignor to National Starch & Chemical Corp., Bridgewater, N.J.

Filed Dec. 11, 1985, Ser. No. 807,888

Int. Cl.[4] C08F *26/02*

U.S. Cl. 526—301 **3 Claims**

1. A pressure sensitive adhesive composition comprising a polymer prepared by an emulsion polymerization procedure, said polymer consisting essentially of 35–50% by weight of a vinyl ester of an alkanoic acid, 15–30% by weight ethylene, 35–50% by weight of di-2-ethylhexyl maleate or a corresponding fumarate and 0–3% of a copolymerizable comonomer selected from the group consisting of monoethyl maleate, acrylamide, acrylic acid, allyl carbamate, N-methylol (meth)-acrylamide, N-vinylpyrrolidinone, diallyl adipate, triallyl cyanurate, butanediol diacrylate, allyl methacrylate, and hydroxyalkyl acrylate.

4,812,548

LIQUID CRYSTALLINE POLYMER

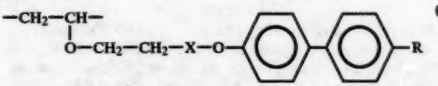
Toshihiro Sagane, 7 Presidential Apartments, Amherst, Mass. 01002, and Robert W. Lenz, Polymer Science and Engineering Dept., University of Massachusetts, Amherst, Mass. 01003

Filed Mar. 31, 1988, Ser. No. 176,269

Int. Cl.[4] C08F *12/24*

U.S. Cl. 526—313 **11 Claims**

1. A thermotropic polymer capable of forming an optically anisotropic phase comprising recurring units of the formula (1)



(1)

wherein R is a substantially linear organic substituent having a bulkiness factor greater than about 4 Å, and wherein X is a direct bond, $-O-(-CH_2-)_n-$, where n is an integer of 1 to 8 or $-OCH_2CH_2)_m$,

where m is 1, 2 or 3, said polymer having a molecular weight distribution ($\overline{M}w/\overline{M}n$) of less than about 1.4.

4,812,549

RESINOUS COMPOSITION COMPRISING AN ACRYLIC RESIN HAVING END CARBOXYL BEARING LONG PENDANT GROUPS AND PREPARATION THEREOF

Hisaichi Muramoto, Osaka; Keizou Ishii, Ashiya, and Tadafumi Miyazono, Takatsuki, all of Japan, assignors to Nippon Paint Co., Ltd., Osakashi, Japan

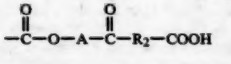
Filed Jan. 7, 1987, Ser. No. 1,010

Claims priority, application Japan, Jan. 8, 1986, 61-001901

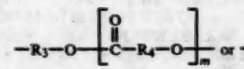
Int. Cl.[4] C08F *20/10*

U.S. Cl. 526—318 **1 Claim**

1. A resinous composition comprising an acrylic resin having end carboxyl bearing long pendant groups of the formula:



wherein R_2 is a substituted or unsubstituted aliphatic hydrocarbon having 2 to 10 carbon atoms, alicyclic hydrocarbon having 6 to 7 carbon atoms or aromatic hydrocarbon having 6 carbon atoms; A is a repeating unit of



R_3 is ethylene or propylene; R_4 is a substituted or unsubstituted alkylene having 2 to 7 carbon atoms; R_5 is a substituted or unsubstituted alkylene having 2 to 5 carbon atoms; m is an integer of 1 to 10; and n is an integer of 2 to 50.

4,812,550

PREPARATION OF LATICES

David E. Erickson, Stow, Ohio, and Thomas F. Reed, Andover, Mass., assignors to GenCorp Inc., Akron, Ohio

Filed Mar. 30, 1987, Ser. No. 31,976
Int. Cl.[4] C08H *1/00*; C08F *289/00*
U.S. Cl. 527—201 7 Claims

1. The method which comprises graft copolymerizing or over copolymerizing on a solubilized protein at last one copolymerizable unsaturated monomer having not over 14 carbon atoms and being selected from the group consisting of conjugated dienes, nitriles, amides, acrylates, alkacrylates, vinyl aryl monomers and vinyl pyridines in aqueous alkaline media using a free radical azo catalyst while continuously ultrasonically irradiating the aqueous alkaline media during the course of the polymerization to provide a latex of reduced viscosity and increased solids content, where on a dry weight basis

(a) said unsaturated monomer is used in an amount of from about 90 to 70 parts by weight and

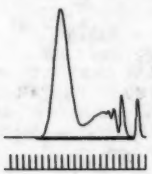
(b) said protein is used in an amount of from 10 to 30 parts by weight, the sum of (a) and (b) being 100 parts by weight.

4,812,551

NOVOLAK RESIN FOR POSITIVE PHOTORESIST

Fumio Oi, Ashiya; Haruyoshi Osaki, Toyonaka; Akihiro Furuta, Takatsuki; Yukikazu Uemura, Amagasaki; Takao Ninomiya, Ibaraki; Yasunori Uetani, Minoo, and Makoto Hanabata, Hyogo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 9, 1987, Ser. No. 118,041
Claims priority, application Japan, Nov. 8, 1986, 61-266402; Sep. 2, 1987, 62-220664
Int. Cl.[4] C08G *8/04*
U.S. Cl. 528—129 5 Claims



1. A novolak resin for a positive photoresist which is produced by the addition condensation reaction of a phenol with formaldehyde and characterized in that the area ratio of the gel permeation chromatographic pattern as measured by the use of a UV(254 nm) detector, is as follows: the range wherein the molecular weight, calculated as polystyrene, is from 150 to less that 500, not including a phenol and the unreacted monomer, is from 8 to 35%, hereinafter referred to as an A region, the range wherein the molecular weight calculated as polystyrene is from 500 to less than 5000 is from 0 to 30%, hereinafter referred to as a B region, and the range wherein the molecular weight calculated as polystyrene exceeds 5000 is from 35 to 92%, herein after referred to as the C region, and wherein the ratio of the B region to the A region is 2.50 or less.

4,812,552

PROCESS FOR PREPARING POLY(ARYLENE SULFIDE KETONE) WITH WATER ADDITION

Michael D. Clifton, Martinez, Ga., and Jon F. Geibel, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 15, 1987, Ser. No. 38,692
Int. Cl.[4] C08G *65/38*
U.S. Cl. 528—226 19 Claims

1. A method for preparing a poly(arylene sulfide ketone) comprising:

contacting a polar organic compound, a polyhalobenzophenone, an alkali metal sulfide, and water, employing a molar excess of water with respect to the alkali metal sulfide sufficient to improve the melt stability of the resulting poly(arylene sulfide ketone) but yet not sufficient to cause a molecular weight limiting phase separation, and employing a molar ratio of polyhalobenzophenone to alkali metal sulfide of about 0.95:1 to about 1.05:1, under polymerization conditions effective for producing the poly(arylene sulfide ketone) of improved melt stability.

4,812,553

PREPARATION OF UNSATURATED POLYESTERS USING BIS-HYDROXYALKYL ESTERS OF AROMATIC DICARBOXYLIC ACIDS

Stephen H. Harris, West Chester, Pa., assignor to Arco Chemical Technology, Inc., Wilmington, Del.

Filed Oct. 16, 1987, Ser. No. 109,125
Int. Cl.[4] C08G *63/02*
U.S. Cl. 528—272 9 Claims

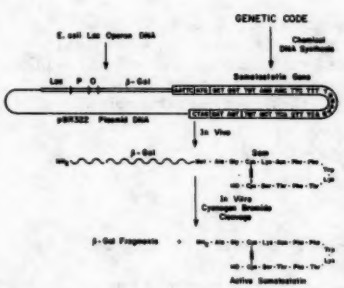
1. A method of preparing novel polyesters comprising condensing (a) unsaturated diacids or their anhydrides with (b) a monomeric bis-hydroxyalkyl ester of an aromatic diacid in a mole ratio of (b):(a) of about 1:1.

4,812,554

SOMATOSTATIN PEPTIDE CONJUGATE

Arthur D. Riggs, La Verne, Calif., assignor to Genentech, Inc., South San Francisco, Calif.

Division of Ser. No. 403,676, Jul. 30, 1982, Pat. No. 4,563,424, which is a division of Ser. No. 090,980, Nov. 5, 1979, Pat. No. 4,366,246, which is a continuation-in-part of Ser. No. 849,591, Nov. 8, 1977, abandoned. This application Oct. 16, 1985, Ser. No. 787,871
Int. Cl.[4] C07K *7/00, 13/00*; C12N *15/00*
U.S. Cl. 530—311 5 Claims



1. A polypeptide conjugate comprising a first polypeptide having the amino acid sequence of somatostatin conjugated by a peptide bond to a second polypeptide wherein said peptide bond is between the N-terminal amino acid of one of said polypeptides and the C-terminal amino acid of the other, the conjugate so formed being immunogenic with respect to one or more somatostatin determinants.

4,812,555
PEPTIDES POSSESSING RENIN INHIBITORY ACTIVITY

Peter Raddatz, Darmstadt; Günter Hölzemann, Seeheim; Alfred Jonczyk, Darmstadt; Claus J. Schmitges, Groes-Umstadt, and Klaus O. Minck, Ober-Ramstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 925,596, Oct. 31, 1986, abandoned. This application Mar. 22, 1988, Ser. No. 171,973

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1985, 3538749

Int. Cl.[4] A61K *37/02*

U.S. Cl. 530—323 24 Claims

1. A peptide compound of the formula I

$$X—Z—NR^2—CHR^3—CHOH—(CHR^4)_n—CO—E \quad I$$

wherein

X is H, $R^1—O—C_mH_{2m}—CO—$, $R^1—C_mH_{2m}—O—CO—$, $R^1—C_mH_{2m}—CO—$, $R^1—SO_2—$, $(R^1—C_mH_{2m})—L(R^1—C_pH_{2p})—C_rH_{2r}—CO—$, $H—(NHCH_2CH_2)_m—NH—CH_2CO—$ or 9-fluorenyl-$C_mH_{2m}—O—CO—$,

Z is 1 to 4 amino acid radicals which are bonded to one another in peptide form and chosen independently from Abu, Ada, Ala, Arg, Asn, Bia, Cal, Dab, Gln, Gly, His, N(im)-alkyl-His, Ile, Leu, tert.-Leu, Lys, Met, α-Nal, βNal, Nbg, Nle, Orn, Phe, Pro, Ser, Thr, Tic, Trp, Tyr, and Val, is OH, OA, NH_2, NHA or NA_2,

R^1 is H, A, Ar, Ar-alkyl, cycloalkyl which has 3 to 7 C atoms and is unsubstituted or mono- or polysubstituted by alkyl, alkoxy and/or Hal, cycloalkyl-alkyl with 4–11 C atoms, bicycloalkyl or tricycloalkyl with in each case 7–14 C atoms or bicycloalkylalkyl or tricycloalkylalkyl with in each case 8–18 C atoms, wherein the group $(R^1—C_mH_{2m})—L(R^1—C_pH_{2p})$ also can be pyrrolidino, piperidino, morpholino or thiomorpholino,

R^2 and R^4 are each independently H or A,

R^3 is cycloalkylalkyl, bicycloalkylalkyl or tricycloalkylalkyl with in each case up to 18 C atoms,

L is CH or N,

m, p and r are each independently, 0, 1, 2, 3, 4 or 5,

n is 1 or 2,

Ar is phenyl, naphthyl or phenyl substituted by A, AO, Hal, CF_3, OH or NH_2,

Hal is F, Cl, Br or I and

A is alkyl of 1–8 C atoms,

wherein one or more —NH—CO— groups can be replaced by —N(alkyl)—CO— groups, and wherein A and Hal groups can be the same or different, or a pharmaceutically acceptable salt thereof with the proviso that

E is OH, Oalkyl of 5–8 C atoms, NHA or NA_2

when at the same time

Z is $(Pro)_x—Y$,

x is 0 or 1,

Y is Phe-Phe, Phe-His, Phe-Leu, Phe-Tyr, Phe-Nle, His-Phe, His-His, His-Leu, His-Tyr, His-Nle, Leu-Phe, Leu-His, Leu-Leu, Leu-Tyr, Leu-Nle, Tyr-Phe, Tyr-His, Tyr-Leu, Tyr-Tyr, Tyr-Nle, αNal-Phe, αNal-His, αNal-Leu, αNal-Tyr or αNal-Nle,

R^2 and R^4 are each H,

R^3 is cycloalkylalkyl with 5–10 C atoms, and

n is 1.

4,812,556
SYNTHETIC PEPTIDE ANTIGEN FOR THE DETECTION OF HIV-2 INFECTION

Anders Vahlne, Hovas; Bo Svennerholm, Gothenburg; Lars Rymo, Hovas; Stig Jeansson, and Peter Horal, both of Gothenburg, all of Sweden, assignors to Virovahl, Switzerland

Filed May 18, 1987, Ser. No. 51,727

Int. Cl.[4] C07K *7/10*

U.S. Cl. 530—324 2 Claims

1. An antigenic peptide of the formula: Asp-Gln-Ala-Arg-Leu-Asn-Ser-Trp-Gly-Cys-Ala-Phe-Arg-Gln-Val-Cys-His-Thr-Thr-Val-Pro-Trp-Val-Asn-Y-Z,

wherein X is either a H of the amino terminal NH_2 group of the peptide or an additional amino acid bonded to the amino terminal N_2 group of the peptide, the additional amino acid being selected to facilitate coupling of the peptide to a carrier protein; Y is absent or CYS; and Z is OH or NH_2.

4,812,557
STABLE COMPOSITION OF INTERLEUKIN-2 AND HUMAN SERUM ALBUMIN

Mikura Yasushi; Asada Kensuke, both of Suita, and Toguchi Hajime, Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Osaka, Japan

Division of Ser. No. 720,754, Apr. 8, 1985, Pat. No. 4,645,830. This application Nov. 17, 1986, Ser. No. 931,704

Claims priority, application Japan, Apr. 9, 1984, 59-71568; Jan. 25, 1985, 60-13226; Feb. 25, 1985, 60-37184

Int. Cl.[4] A61K *45/02, 37/02*

U.S. Cl. 530—351 15 Claims

1. A human interleukin-2 composition in the form of an aqueous solution or frozen matter which comprises in addition to human interleukin-2, human serum albumin in a concentration of about 0.1 to 50 mg/ml as an aqueous solution, and, as a solution, is adjusted to have a pH between 3 to 5.5.

4,812,558
TRIAZINE COMPOUND HAVING TWO VINYLSULFONE TYPE FIBER REACTIVE GROUPS

Takashi Omura, Ashiya, and Kazufumi Yokogawa, Minoo, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

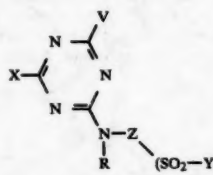
Filed Nov. 10, 1987, Ser. No. 119,333

Claims priority, application Japan, Nov. 19, 1986, 61-275674; Feb. 20, 1987, 62-38300

Int. Cl.[4] C07D *251/12, 251/16, 251/26*

U.S. Cl. 534—618 8 Claims

1. A triazine compound represented by the following formula,

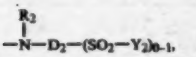


wherein R is hydrogen or C_{1-4} alkyl unsubstituted or substituted by hydroxy, cyano, C_{1-4} alkoxy, halogeno, carboxy, carbamoyl, C_{1-4} alkoxycarbonyl, C_{1-4} alkylcarbonyloxy, sulfo or sulfamoyl, Y is vinyl or $—CH_2CH_2L$ in which L is a group splittable by the action of an alkali, Z is phenylene or naphthylene unsubstituted or substituted once by sulfo, X is halogeno, C_{1-4} alkoxy, sulfoethylamino, N-methylsulfoethylamino, mono- or di-ethanolamino, β-ethoxyethanolamino, ethyanolamino, phenoxy, anilino unsubstituted or substituted by sulfo, carboxy, chloro, C_{1-4} alkyl or C_{1-4} alkoxy, or a group of the formula (1),

$$—N(R_1)—D_1—(SO_2—Y_1)_{0-1}, \quad (1)$$

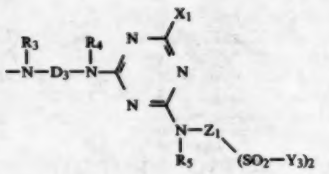
wherein R_1 is hydrogen or C_{1-4} alkyl unsubstituted or substituted by hydroxy, cyano, C_{1-4} alkoxy, halogeno, carboxy, carbamoyl, C_{1-4} alkoxycarbonyl, C_{1-4} alkylcarbonyloxy, sulfo or sulfamoyl, D_1 is a moiety of an anionic dye having $—SO_3^{\ominus}$

as the anion selected from metal-containing and metal-free azo, anthraquinone, metal-containing phthalocyanine, metal-containing formazane, dioxazine and stilbene dyes, and Y_1 is vinyl or $—CH_2CH_2L$ in which L is as defined above, and V is a group of formula (2),



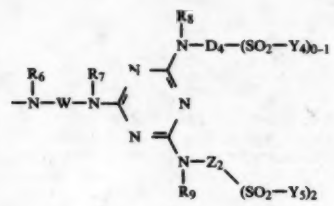
(2)

wherein R_2 is hydrogen or C_{1-4} alkyl unsubstituted or substituted by hydroxy, cyano, C_{1-4} alkoxy, halogeno, carboxy, carbamoyl, C_{1-4} alkoxycarbonyl, C_{1-4} alkylcarbonyloxy, sulfo or sulfamoyl, D_2 is a moiety of an anionic dye having $—SO_3^{\ominus}$ as the anion selected from metal-containing phthalocyanine, metal-containing formazane, dioxazine and stilbene dyes, and Y_2 is vinyl or $—CH_2CH_2L$ in which L is as defined above, or the formula (3),



(3)

wherein R_3, R_4 and R_5 independently of one another are each hydrogen or C_{1-4} alkyl unsubstituted or substituted by hydroxy, cyano, C_{1-4} alkoxy, halogeno, carboxy, carbamoyl, C_{1-4} alkoxycarbonyl, C_{1-4} alkylcarbonyloxy, sulfo or sulfamoyl, D_3 is a moiety of an anionic dye having $—SO_3^{\ominus}$ as the anion selected from metal-containing and metal-free azo, anthraquinone, metal-containing phthalocyanine, metal-containing formazane, dioxazine and stilbene dyes, X_1 is halogeno, C_{1-4} alkoxy, sulfoethylamino, N-methyl-sulfoethylamino, mono- or diethanolamino, β-ethoxyethanolamino, phenoxy, anilino unsubstituted or substituted by sulfo, carboxy, chloro, C_{1-4} alkyl or C_{1-4} alkoxy, Y_3 is vinyl or $—CH_2CH_2L$ in which L is as defined above, and Z_1 is phenylene or naphthylene unsubstituted or substituted once by sulfo, or the formula (4)



(4)

wherein W is a divalent group selected from C_{2-6} alkylene, phenylene, mono- or di-sulfophenylene, 1,3,5-trimethyl-4-sulfo-2,6-phenylene, 6-substituted-1,3,5-triazine-2,4-di-yl or stilben-4,4'-di-yl, R_6, R_7, R_8 and R_9 independently of one another are each hydrogen or C_{1-4} alkyl unsubstituted or substituted by hydroxy, cyano, C_{1-4} alkoxy, halogeno, carboxy, carbamoyl, C_{1-4} alkoxycarbonyl, C_{1-4} alkylcarbonyloxy, sulfo or sulfamoyl, X_2 is phenylene or naphthylene unsubstituted or substituted once by sulfo, D_4 is a moiety of an anionic dye having $—SO_3^{\ominus}$ as the anion selected from metal-containing and metal-free azo, anthraquinone, metal-containing phthalocyanine, metal-containing formazane, dioxazine and stilbene dyes, and Y_4 and Y_5 independently of one another are each vinyl or $—CH_2CH_2L$ in which L is as defined above.

4,812,559

VACCINE AGAINST VARICELLA-ZOSTER VIRUS

Ronald W. Ellis, Overbrook Hills; Paul M. Keller, Lansdale; Robert S. Lowe, Harleysville, all of Pa., and Andrew J. Davison, Glasgow, Scotland, assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 762,001, Aug. 2, 1985, Pat. No. 4,686,101. This application Mar. 23, 1987, Ser. No. 28,826

Int. Cl.[4] **C07H** *15/12;* **C12P** *21/02;* **C12N** *15/00, 1/00*

U.S. Cl. 536—27 **1 Claim**

1. A 2.6 kbp fragment of VZV DNA having the nucleotide sequence:

ATG TTT GTT ACG GCG GTT

GTG TCG GTC TCT CCA AGC TCG TTT
TAT GAG AGT TTA CAA GTA

GAG CCC ACA CAA TCA GAA GAT ATA
ACC CGG TCT GCT CAT CTG

GGC GAT GGT GAT GAA ATC AGA GAA
GCT ATA CAC AAG TCC CAG

GAC GCC GAA ACA AAA CCC ACG TTT
TAC GTC TGC CCA CCG CCA

ACA GGC TCC ACA ATC GTA CGA TTA
GAA CCA ACT CGG ACA TGT

CCG GAT TAT CAC CTT GGT AAA AAC
TTT ACA GAG GGT ATT GCT

GTT GTT TAT AAA GAA AAC ATT GCA
GCG TAC AAG TTT AAG GCG

ACG GTA TAT TAC AAA GAT GTT ATC
GTT AGC ACG GCG TGG GCC

GGA AGT TCT TAT ACG CAA ATT ACT
AAT AGA TAT GCG GAT AGG

GTA CCA ATT CCC GTT TCA GAG ATC
ACG GAC ACC ATT GAT AAG

TTT GGC AAG TGT TCT TCT AAA GCA
ACG TAC GTA CGA AAT AAC

CAC AAA GTT GAA GCC TTT AAT GAG
GAT AAA AAT CCA CAG GAT

ATG CCT CTA ATC GCA TCA AAA TAT
AAT TCT GTG GGA TCC AAA

GCA TGG CAT ACT ACC AAT GAC ACG
TAC ATG GTT GCC GGA ACC

CCC GGA ACA TAT AGG ACG GGC ACG
TCG GTG AAT TGC ATC ATT

GAG GAA GTT GAA GCC AGA TCA ATA
TTC CCT TAT GAT AGT TTT

GGA CTT TCC ACG GGA GAT ATA ATA
TAC ATG TCC CCG TTT TTT

GGC CTA CGG GAT GGT GCA TAC AGA
GAA CAT TCC AAT TAT GCA

ATG GAT CGT TTT CAC CAG TTT GAC
GGT TAT AGA CAA AGG GAT

CTT GAC ACT AGA GCA TTA CTG GAA
CCT GCA GCG CGG AAC TTT

TTA GTC ACG CCT CAT TTA ACG GTT
GGT TGG AAC TGG AAG CCA

AAA CGA ACG GAA GTT TGT TCG CTT
GTC AAG TGG CGT GAG GTT

-continued

GAA GAC GTA GTT CGC GAT GAG TAT
GCA CAC AAT TTT CGC TTT

ACA ATG AAA ACA CTT TCT ACC ACG
TTT ATA AGT GAA ACA AAC

GAG TTT AAT CTT AAC CAA ATC CAT
CTC AGT CAA TGT GTA AAG

GAG GAA GCC CGG GCT ATT ATT AAC
CGG ATC TAT ACA ACC AGA

TAC AAC TCA TCT CAT GTT AGA ACC
GGG GAT ATC CAG ACC TAC

CTT GCC AGA GGG GGG TTT GTT GTG
GTG TTT CAA CCC CTG CTG

AGC AAT TCC CTC GCC CGT CTC TAT
CTC CAA GAA TTG GTC CGT

GAA AAC ACT AAT CAT TCA CCA CAA
AAA CAC CCG ACT CGA AAT

ACC AGA TCC CGA CGA AGC GTG CCA
GTT GAG TTG CGT GCC AAT

AGA ACA ATA ACA ACC ACC TCA TCG
GTG GAA TTT GCT ATG CTC

CAG TTT ACA TAT GAC CAC ATT CAA
GAG CAT GTT AAT GAA ATG

TTG GCA CGT ATC TCC TCG TCG TGG
TGC CAG CTA CAA AAT CGC

GAA CGC GCC CTT TGG AGC GGA CTA
TTT CCA ATT AAC CCA AGT

GCT TTA GCG AGC ACC ATT TTG GAT
CAA CGT GTT AAA GCT CGT

ATT CTC GGC GAC GTT ATC TCC GTT
TCT AAT TGT CCA GAA CTG

GGA TCA GAT ACA CGC ATT ATA CTT
CAA AAC TCT ATG AGG GTA

TCT GGT AGT ACT ACG CGT TGT TAT
AGC CGT CCT TTA ATT TCA

ATA GTT AGT TTA AAT GGG TCC GGG
ACG GTG GAG GGC CAG CTT

GGA ACA GAT AAC GAG TTA ATT ATG
TCC AGA GAT CTG TTA GAA

CCA TGC GTG GCT AAT CAC AAG CGA
TAT TTT CTA TTT GGG CAT

CAC TAC GTA TAT TAT GAG GAT TAT
CGT TAC GTC CGT GAA ATC

GCA GTC CAT GAT GTG GGA ATG ATT
AGC ACT TAC GTA GAT TTA

AAC TTA ACA CTT CTT AAA GAT AGA
GAG TTT ATG CCG CTG CAA

GTA TAT ACA AGA GAC GAG CTG CGG
GAT ACA GGA TTA CTA GAC

TAC AGT GAA ATT CAA CGC CGA AAT
CAA ATG CAT TCG CTG CGT

TTT TAT GAC ATA GAC AAG GTT GTG
CAA TAT GAT AGC GGA ACG

GCC ATT ATG CAG GGC ATG GCT CAG
TTT TTC CAG GGA CTT GGG

-continued

ACC GCG GGC CAG GCC GTT GGA CAT
GTG GTT CTT GGG GCC ACG

GGA GCG CTG CTT TCC ACC GTA CAC
GGA TTT ACC ACG TTT TTA

TCT AAC CCA TTT GGG GCA TTG GCC
GTG GGA TTA TTG GTT TTG

GCG GGA CTG GTA GCG GCC TTT TTT
GCG TAC CGG TAC GTG CTT

AAA CTT AAA ACA AGC CCG ATG AAG
GCA TTA TAT CCA CTC ACA

ACC AAG GGG TTA AAA CAG TTA CCG
GAA GGA ATG GAT CCC TTT

GCC GAG AAA CCC AAC GCT ACT GAT
ACC CCA ATA GAA GAA ATT

GGC GAC TCA CAA AAC ACT GAA CCG
TCG GTA AAT AGC GGG TTT

GAT CCC GAT AAA TTT CGA GAA GCC
CAG GAA ATG ATT AAA TAT

ATG ACG TTA GTA TCT GCG GCT GAG
CGC CAA GAA TCT AAA GCC

CGC AAA AAA AAT AAG ACT AGC GCC
CTT TTA ACT TCA CGT CTT

ACC GGC CTT GCT TTA CGA AAT CGC
CGA GGA TAC TCC CGT GTT

CGC ACC GAG ATT GTA ACG GGG GTG
TAA.

4,812,560

PROCESS FOR PRODUCING 1-β-D-ARABINOFURANOSYLCYTOSINE-5'-STEARYLPHOSPHATE MONOSODIUM SALT AND MONOHYDRATE THEREOF

Takashi Terada, Yono; Minoru Aoki, Tokyo; Hiroshi Ohtaki, Yono; Manami Morozumi, Choshi, and Mitsuharu Shiozaki, Yono, all of Japan, assignors to Yamasa Shoyu Kabushiki Kaisha, Chiba and Nippon Kayaku Kabushiki Kaisha, Tokyo, both of, Japan

Filed Mar. 23, 1987, Ser. No. 28,951

Claims priority, application Japan, Mar. 24, 1986, 61-63963; May 21, 1986, 61-114680

Int. Cl.[4] C07H *19/10, 1/00;* **A61K** *31/70*

U.S. Cl. 536—29 **7 Claims**

1. A process for producing 1-β-D-arabinofuranosylcytosine-5'-sterylphosphate monosodium salt having a sodium content not less than about 95 mol% of the stoichiometric amount, which comprises the steps of adjusting an aqueous solution or suspension of 1-β-D-arabinofuranosylcytosine-5'-sterylphosphate to pH 9.7 to 13 by sodium hydroxide, and precipitating said 1-β-D-arabinofuranosylcytosine-5'-sterylphosphate monosodium salt.

4,812,561
CRYSTALLINE HYDRATE OF ORAL CEPHALOSPORIN AND ITS COMPOSITION

Yoshio Hamashima, Kyoto; Kyoji Minami, Nara; Kyozo Kawata; Terno Sakamoto, both of Osaka; Toyohiko Takeda, Hyogo; Yusuke Suzuki, Osaka, and Masanori Tujikawa, Nara, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Jul. 1, 1987, Ser. No. 68,333
Claims priority, application Japan, Jul. 2, 1986, 61-156954; Sep. 12, 1986, 61-216260
Int. Cl.[4] A61K *31/545*; C07D *501/20*
U.S. Cl. 540—222 4 Claims

1. A crystalline hydrate of 7β-[(Z)-2-(2-aminothiazol-4-yl)-4-carboxybut-2-enoylamino]-3-cephem-4-carboxylic acid having the X-ray diffraction pattern as follows:

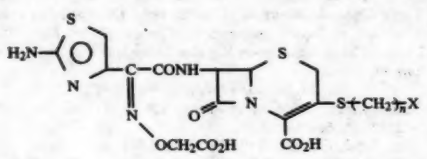
d	I/I_0	d	I/I_0	d	I/I_0	d	I/I_0
5.90	12	20.95	100	28.70	17	35.93	08
7.35	08	21.15	70	29.40	27	36.38	24
9.45	92	21.75	25	29.60	11	37.00	07
10.15	21	22.25	49	29.90	16	38.30	26
12.08	46	23.85	62	30.40	19	38.65	10
14.87	30	24.50	39	31.10	53	39.20	15
15.65	14	24.80	16	31.60	23	39.60	21
16.25	13	25.50	34	31.78	34	40.27	15
18.35	24	25.85	66	33.02	28	41.22	22
18.90	71	26.60	16	33.55	23	42.55	08
19.14	77	27.02	59	33.86	17	44.20	09
19.40	60	27.30	35	35.20	16		
20.58	88	28.35	54	35.65	10		

4,812,562
CEPHALOSPORIN DERIVATIVES

Yoshiaki Watanabe, Tokyo; Chihiro Yokoo, Gyoda; Masami Goi, Kitasaitama; Akira Onodera, Kuki; Mitsuo Murata, Kitakatsushika; Hiroshi Fukushima, Minamisaitama, and Kaoru Sota, Tokorozawa, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Japan

Filed Jul. 22, 1986, Ser. No. 887,941
Claims priority, application Japan, Jul. 25, 1985, 60-164664
Int. Cl.[4] C07D *501/36*; A61K *31/545*
U.S. Cl. 540—227 7 Claims

1. Cephalosporin derivatives represented by the formula:



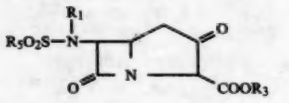
wherein X represents halogen, hydroxyl, cyano, trifluoromethyl, amino, lower alkylcarbonylamino, lower alkoxy, lower alkylthio, lower alkoxycarbonyl, carbamoyl, N,N-dimethylcarbamoyl, N,N-diethylcarbamoyl, N-methylcarbamoyl, N-ethylcarbamoyl, carbamoyloxy, lower alkylcarbonyl, lower alkenyl, ethynyl, thiocyanate or, α-carboxyaminomethyl, and n is an integer of 1 to 3, and the non-toxic, pharmaceutically acceptable salts thereof.

4,812,563
6-(DISUBSTITUTED AMINO)CARBAPENAM COMPOUNDS

Takeo Yoshioka, Ayase; Noritaka Chida, Sagamihara; Azuma Watanabe, Yokohama; Yasuo Fukagawa, Kamakura, and Tomoyuki Ishikura, Chigasaki, all of Japan, assignors to Senraku Incorporated, Tokyo, Japan

Filed Mar. 10, 1987, Ser. No. 24,160
Claims priority, application Japan, Mar. 11, 1986, 61-51556
Int. Cl.[4] C07D *487/04*
U.S. Cl. 540—302 1 Claim

1. A compound of the formula



wherein

R_1 represents lower alkyl or lower haloalkyl,

R_5 is lower alkyl, and

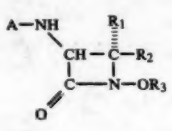
R_3 represents a hydrogen atom or a carboxyl protecting group which can be easily split off.

4,812,564
PROCESS FOR PREPARING 4,4-DIALKYL-2-AZETIDINONES UTILIZING A PYRIDINE (OR SUBSTITUTED PYRIDINE) SULFUR TRIOXIDE COMPLEX

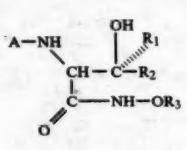
William A. Slusarchyk, Belle Mead, and Tamara Dejneka, Skillman, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 856,527, Apr. 28, 1986, Pat. No. 4,694,083, which is a division of Ser. No. 695,775, Feb. 28, 1985, Pat. No. 4,638,061. This application May 11, 1987, Ser. No. 48,439
Int. Cl.[4] C07D *205/08*
U.S. Cl. 540—355 7 Claims

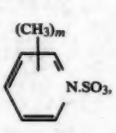
1. A process for preparing a compound having the formula



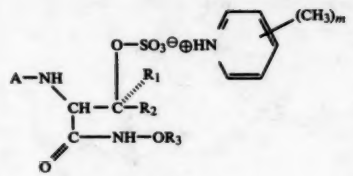
which comprises sulfonating a compound having the formula



with a complex having the formula



and cyclizing the resulting compound having the formula



by treatment with a base;

wherein A is benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, t-butyloxycarbonyl, o-nitrophenylsulfenyl or triphenylmethyl;

R_1 and R_2 are the same or different and each is alkyl of 1 to 4 carbons;

R_3 is benzyl, p-nitrobenzyl, benzyloxymethyl, 2-methoxy-2-propyl, 2-ethoxy-2-propyl, tetrahydropyran-2-yl, 2-trimethylsilylethyl, t-butyldimethylsilyl or t-butyldiphenylsilyl; and

m is 0, 1, 2 or 3.

4,812,565

FUSED AROMATIC OXAZEPINONES, THIAZEPINONES, DIAZEPINONES AND SULFUR ANALOGS THEREOF

Albert D. Cale, Jr., Mechanicsville, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

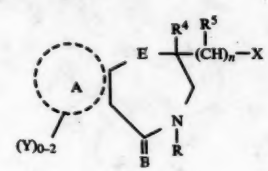
Division of Ser. No. 835,805, Mar. 3, 1986, Pat. No. 4,705,853, and a continuation-in-part of Ser. No. 746,091, Jun. 18, 1985, Pat. No. 4,592,866, which is a continuation-in-part of Ser. No. 652,058, Sep. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 527,559, Aug. 29, 1983, abandoned, which is a continuation-in-part of Ser. No. 431,500, Sep. 30, 1982, abandoned. This application Feb. 25, 1987, Ser. No. 18,676

The portion of the term of this patent subsequent to Feb. 10, 2004, has been disclaimed.

Int. Cl.[4] C07D *223/16*

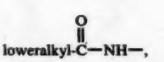
U.S. Cl. 540—491 **9 Claims**

1. A compound of the formula:

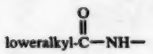


wherein;

A represents an aromatic or heterocyclic ring having two of its carbon atoms held mutually with the oxazepine, thiazepine or diazepine moiety selected from the group consisting of benzene, naphthalene, a quinoline, a pyridine in any of its four positions, any of which rings are optionally substituted by one or two Y radicals selected from the group consisting of halo, loweralkyl, diloweralkylamino, nitro, amino,



trifluoromethyl, phenyl or phenyl substituted by one to three Y' groups selected from halo, loweralkyl, loweralkoxy, diloweralkylamino, nitro, anino,



or trifluoromethyl,

E is selected from oxygen, sulfur or

B is selected from oxygen or sulfur,

R is selected from the group consisting of loweralkyl, cycloalkyl(3–9C) or phenyl-loweralkyl wherein phenyl is optionally substituted by one or two radicals selected from halo, loweralkoxy, nitro or trifluoromethyl,

n is 1 or 2,

R^4 and R^5 are selected from hydrogen or loweralkyl(1–5C),

X is halogen selected from chlorine, bromine, cyano or 1-phthalimido, the optical isomers thereof and the acid additions salts thereof.

4,812,566

PROCESS FOR PREPARING 1-DODECYLAZACYCLOHEPTANE-2-ONE

Toshinari Nabata, Kobe, Japan, assignor to KOEI Chemical Co., Ltd., Osaka, Japan

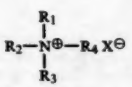
Filed Dec. 17, 1987, Ser. No. 134,381

Claims priority, application Japan, Dec. 24, 1986, 61-314501

Int. Cl.[4] C07D *223/10*

U.S. Cl. 540—533 **12 Claims**

1. A process for preparing 1-dodecylazacycloheptane-2-one comprising reacting azacycloheptane2-one with dodecyl halide in a substantially non-aqueous system in the presence of a phase-transfer catalyst represented by the formula:



wherein R_1, R_2, R_3 and R_4 are selected from the group consisting of alkyl having 1 to 12 carbon atoms and phenyl-C_1-C_3-alkyl group, and two or three of the groups R_1, R_2, R_3 and R_4, when taken together with the nitrogen to which they are attached, form a 5- or 6-membered, saturated or unsaturated heterocyclic group containing one nitrogen atom, and X^- is an anion selected from the group consisting of a halogen, hydrogensulfate, hydroxyl and perchlorate.

4,812,567

POLYCYCLIC SPIROIMIDES WITH PSYCHOTROPIC ACTIVITY

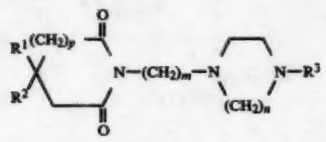
Magid A. Abou-Gharbia, Wilmington, Del., assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 787,950, Oct. 16, 1985, abandoned. This application Dec. 17, 1986, Ser. No. 942,897

Int. Cl.[4] C07D *401/14, 403/14, 491/107*

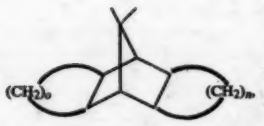
U.S. Cl. 544—230 **4 Claims**

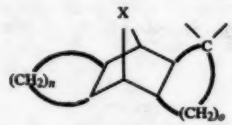
1. A compound having the formula

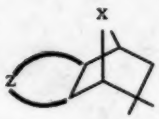


wherein

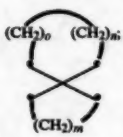
R^1 and R^2 taken together represent







or



R^3 is unsubstituted or monosubstituted 2-pyridinyl, 2-pyrimidinyl, 2-pyrazinyl or 3-pyridazinyl, where the substituents are selected from the group lower alkyl, lower alkoxy, halo, cyano and nitro;

Z is $-(CH_2)_m-$ or vinylene;

X is lower alkylene, vinylene or O;

m is 1–4;

n is 1–3;

o is 1–5;

p is 0–1;

and the pharmaceutically acceptable salts thereof.

4,812,568

PROCESS FOR THE PREPARATION OF 6,13-DIHYDROQUINACRIDONES AND QUINACRIDONES

Helmut Herzog, Leverkusen; Detlef-Ingo Schütze, Cologne; Jürgen Schneider, and Reinold Schmitz, both of Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

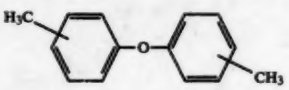
Filed Feb. 10, 1987, Ser. No. 12,921

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1986, 3605976

Int. Cl.[4] C09B *48/00*

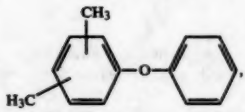
U.S. Cl. 546—49 **8 Claims**

1. A process for the preparation of γ-quinacridone which comprises heating a dialkyl 2,5-di-(phenylamino)-3,6-dihydroterephthalate at 280°–290° C. in an essentially oxygen-free atmosphere in the presence of a solvent comprising a dimethyldiphenyl ether isomer mixture of the formula



(II)

and/or



(IIa)

thereby to produce 6,13-dihydroquinacridone, treating the 6,13-dihydroquinacridone with a substantially anhydrous mixture of a C_1–C_4-alcohol and an alkali, and oxidizing 6,13-dihydroquinacridone thereby to produce the γ-quinacridone.

4,812,569

CHROMOGENIC PHTHALIDES

Udo Eckstein, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

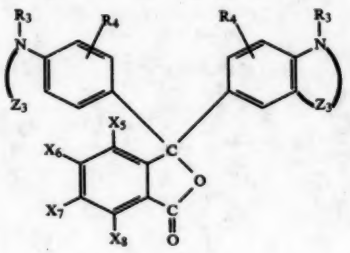
Filed Feb. 27, 1987, Ser. No. 20,292

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1986, 3609344

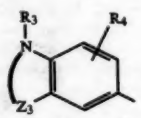
Int. Cl.[4] C07D *405/14*

U.S. Cl. 546—94 **6 Claims**

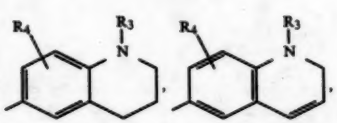
1. A chromogenic phthalide of the formula



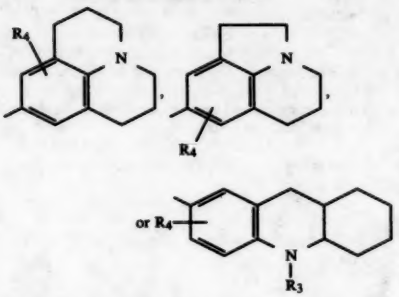
wherein the two radicals



are identical or different and represent



-continued



wherein the (partially) saturated rings can carry up to 4 radicals selected from the group consisting of chlorine, C_1–C_4-alkyl, C_1–C_4-alkoxy and phenyl and, in the case of tetrahydroquinoline and julolidine, the saturated rings must carry at least one of these radicals,

R_3 denotes hydrogen, C_1–C_{12}-alkyl which is unsubstituted or substituted by chlorine, hydroxyl, C_1–C_4-alkoxy or acetyloxy, cyclohexyl, C_1–C_4-alkyl-carbonyl or benzyl or phenyl which are unsubstituted or substituted by chlorine or C_1–C_4-alkyl,

R_4 denotes hydrogen, chlorine, C_1–C_4-alkyl, C_1–C_4-alkoxy, amino which is unsubstituted or mono-substituted or di-substituted by chlorine, cyano, C_1–C_4-alkoxycarbonyl, hydroxyl or C_1–C_4-alkoxy substituted C_1–C_4-alkyl, cyclohexyl, phenyl or benzyl groups, and

X_5, X_6, X_7 and X_8 independently of one another denote hydrogen, chlorine, C_1–C_4-alkyl, C_1–C_4-alkoxy, hydroxyl or phenyl, benzyl or benzyloxy which are unsubstituted or substitututed by chlorine, C_1–C_4-alkyl or C_1–C_4-alkoxy.

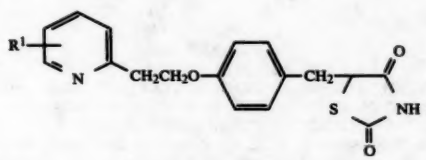
4,812,570

METHOD FOR PRODUCING THIAZOLIDINEDIONE DERIVATIVES

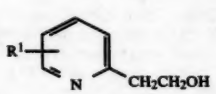
Kanji Meguro, Nishinomiya; Takeshi Fujita, Takarazuka; Chitoshi Hatanaka, Nagaokakyo, and Satoru Ooi, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 14, 1987, Ser. No. 73,695
Claims priority, application Japan, Jul. 24, 1986, 61-174278
Int. Cl.[4] C07D *409/12*
U.S. Cl. 546—280 **1 Claim**

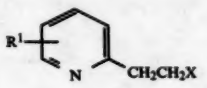
1. A method for producing a compound of the formula:



wherein R^1 is hydrogen or a lower alkyl, which comprises reacting (1) a compound of the formula:

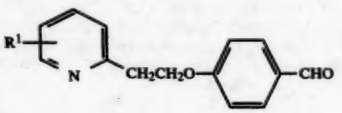


wherein R^1 has the meaning given above, with a halogenating agent or a sulfonyl halide to give a compound of the formula:

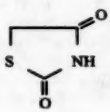


wherein R^1 has the meaning given above and X is a halogen or an alkyl- or aryl-sulfonyloxy, (2) reacting the resulting compound with a compound of the formula:

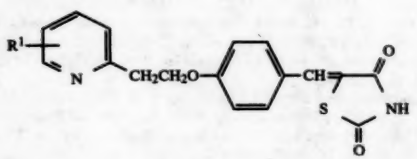
to give a compound of the formula:



wherein R^1 has the meaning given above, (3) reacting the resulting compound with a compound of the formula:



to give a compound of the formula:



wherein R^1 has the meaning given above, and (4) subjecting the resulting compound to catalytic reduction.

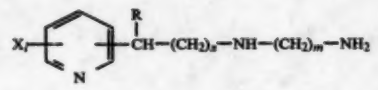
4,812,571

N-(SUBSTITUTED PYRIDYL-ALKYL) ALKYLENEDIAMINE INTERMEDIATES FOR INSECTICIDES

Kozo Shiokawa, Kanagawa; Shinichi Tsuboi, Tokyo; Shinzo Kagabu, Tokyo, and Koichi Moriya, Tokyo, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

Division of Ser. No. 29,303, Mar. 23, 1987, Pat. No. 4,774,247, which is a division of Ser. No. 720,838, Apr. 8, 1985, Pat. No. 4,678,795. This application Dec. 9, 1987, Ser. No. 130,697
Claims priority, application Japan, Apr. 13, 1984, 59-72966; Jun. 29, 1984, 59-132943
Int. Cl.[4] C07D *213/38*
U.S. Cl. 546—296 **1 Claim**

1. A compound of the formula



in which
R is a hydrogen atom or a lower alkyl group,
X is a halogen atom, a lower alkyl group, a lower alkoxy group, a lower alkylthio group, a lower alkylsulfinyl group, a lower alkylsulfonyl group, a lower alkenyl group or a lower alkynyl group; a phenyl, phenoxy, phenylthio, naphthyl, naphthoxy or naphthylthio group which may optionally be substituted by halogen; or a benzyl, phenethyl or naphthylmethyl group,
l is 1, 2, 3 or 4
m is 2, 3 or 4, and
n is 0, 1, 2 or 3.

4,812,572

PROCESS FOR PREPARATION OF FLUOROAROMATIC OR FLUOROHETEROCYCLIC COMPOUNDS

Michael S. Howarth, Littleborough, and David M. Tomkinson, Rochdale, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jul. 27, 1987, Ser. No. 77,875

Claims priority, application United Kingdom, Aug. 8, 1986, 8619375

Int. Cl.[4] C07D *211/72, 211/84, 213/72, 211/90*

U.S. Cl. 546—290 **15 Claims**

1. A process for the preparation of a fluoroaromatic or fluoroheterocyclic compound, which comprises diazotising the corresponding amino-aromatic or amino-heterocyclic compound in hydrogen fluoride and decomposing the diazonium salt in the diazotisation mixture so formed, characterised in that decomposition is carried out at super atmospheric pressure.

4,812,573

PHARMACEUTICALLY ACTIVE COMPOUNDS

Graham J. Durant, Plymouth; Andrew D. Gribble, Knebworth, and Robert A. Slater, Letchworth, all of England, assignors to SmithKline & French Laboratories, Ltd., Welwyn Garden City, England

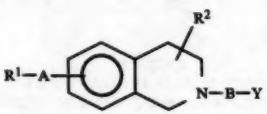
Continuation of Ser. No. 113,302, Oct. 28, 1987, abandoned. This application Jun. 27, 1988, Ser. No. 212,095

Claims priority, application United Kingdom, Oct. 28, 1986, 8625739; Jun. 30, 1987, 8715274

Int. Cl.[4] A61K *31/47*; C07D *217/04*

U.S. Cl. 514—307 **17 Claims**

1. A compound of the formula (I):



(I)

and salts thereof; wherein
A is a group NR^3SO_2 or SO_2NR^3;
B is an acyclic hydrocarbon group having from one to six linear carbon atoms, provided that the carbon atom attached to the nitrogen is saturated;
Y is CO_2H or a group hydrolysable to CO_2H;
R^1 is phenyl optionally substituted by one or more substituents chosen from the group consisting of halogen, C_{1-4}alkyl, C_{1-6}acyl, C_{1-4}alkoxy, nitro and trifluoromethyl;
R^2 is hydrogen or one or more C_{1-4}alkyl substituents located at the 1, 3 and 4 positions of the isoquinoline ring; and
R^3 is hydrogen or C_{1-6}alkyl.

4,812,574

PROCESS FOR PREPARING THIAZOLOBENZIMIDAZOLES AND INTERMEDIATES USED THEREIN

Robin G. Shepherd, Windsor, England; Sie-Yearl Chai, Collegeville, Pa.; Maynard E. Lichty, and Arnold S. Milowsky, both of Coatesville, Pa., assignors to John Wyeth & Brother Ltd., Maidenhead, England and American Home Products Corporation, New York, N.Y.

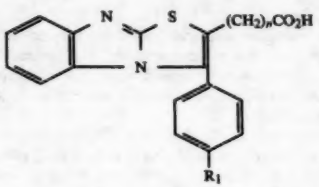
Filed Dec. 23, 1987, Ser. No. 133,823

Claims priority, application United Kingdom, Jan. 21, 1987, 8701228

Int. Cl.[4] C07D *513/04*

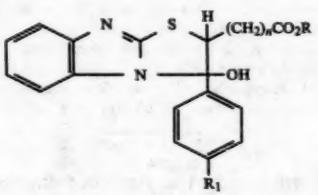
U.S. Cl. 548—151 **10 Claims**

1. A process for preparing a thiazolo[3,2-a]benzimidazole of formula I



I

in which formula n is 1 or 2, and R_1 is hydrogen, lower alkyl, lower alkoxy, trifluoromethyl or halo, or a salt thereof which comprises dehydrating a compound of formula II



II

or a salt thereof wherein n and R_1 are as defined above, and COOR is an acid or ester function in the presence of an acid selected from sulphuric, sulphonic and phosphoric acid or mixtures thereof and if desired or required an inert solvent provided that if water is present then the amount of water is less than about 15% by volume of the acid, the reaction being carried out with heating if necessary.

4,812,575

PROCESS FOR THE PREPARATION OF BENOZOTRIAZOLES AND THEIR POLYMERS, AND 2(2-HYDROXY-5-ISOPROPENYLPHENYL)2H-BENZOTRIAZOLE PRODUCED THEREBY

Otto Vogl, Brooklyn, N.Y., and Zohar Nir, Beer Sheva, Israel, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 29, 1983, Ser. No. 537,219

Int. Cl.[4] C07D *249/20*

U.S. Cl. 548—260 **2 Claims**

2. The compound 2(2-hydroxy-5-isopropenylphenyl)2H-benzotriazole (2H5P) produced by azo coupling of o-nitrophenyl diazonium chloride with p-hydroxyacetophenone, subjecting the resulting isolated azo compound to reductive cyclization with zinc in the presence of sodium hydroxide at a temperature of about 50°–70° C., acidifying the resulting mixture so as to produce 2(2-hydroxy-5-acetylphenyl)2H-benzotriazole

(2H5A), acetylating the isolated 2(2-hydroxy-5-acetylphenyl)2H-benzotriazole (2H5A) so as to produce 2(2-acetoxy-5-acetylphenyl)2H-benzotriazole (2A5A), methylating the isolated 2(2-acetoxy-5-acetylphenyl)2H-benzotriazole (2A5A) with a methyl Grignard reagent and dehydrating the isolated reaction product with potassium hydrogen sulfate so as to produce 2(2-hydroxy-5-isopropenylphenyl)2H-benzotriazole (2H5P).

4,812,576

IMINO DERIVATIVES OF 4-HALOGEN-PYRAZOLONE-5

Erich Wolff, Solingen; Dieter Lowski, Bergheim, and Harry Elias, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

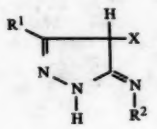
Filed Mar. 16, 1987, Ser. No. 26,160

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1986, 3610702

Int. Cl.[4] C07D *231/38*

U.S. Cl. 548—362 **2 Claims**

1. Compounds corresponding to formula I



I

wherein

X denotes chlorine or bromine,

R^1 denotes H, alkyl with 1 to 18 carbon atoms or a phenyl group which may be substituted with alkyl or alkoxy,

R^2 denotes NH_2 or NH-CO-R^3,

R^3 denotes alkyl with 1 to 18 carbon atoms, a benzyl, phenethyl or ω-phenylpropyl group wherein the phenyl group may be substituted by halogen, alkoxy, nitro or acylamino, a phenyl group which may be substituted by alkyl, alkoxy, chlorine or amino, or a thienyl group.

4,812,577

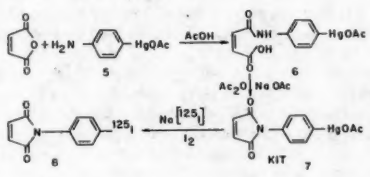
MERCURIC ACETATE PHENYL MALEIMIDE USEFUL FOR PREPARING RADIOHALOGENATED MALEIMIDES

Prem C. Srivastava, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 43,776, Apr. 28, 1987, Pat. No. 4,735,792. This application Feb. 12, 1988, Ser. No. 155,440

Int. Cl.[4] C07D *207/244*

U.S. Cl. 548—404 **1 Claim**



1. A compound for use in a radiopharmaceutical kit for preparing radiohalogenated maleimides consisting of a maleimide having a mercuric acetate phenyl at the N. position, said phenyl having its mercuric acetate functional group at the para-position.

4,812,578

SYNTHESIS OF TETRAMIC ACID

Thomas Meul, Visp, Switzerland, assignor to Lonza Ltd., Gampel/Valais, Switzerland

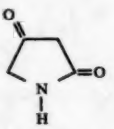
Division of Ser. No. 060,338, Jun. 10, 1987. This application Apr. 28, 1988, Ser. No. 187,547

Claims priority, application Switzerland, Jun. 26, 1986, 2566/86

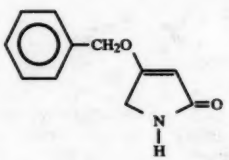
Int. Cl.[4] C07D *207/36*

U.S. Cl. 548—544 **9 Claims**

1. Method for producing tetramic acid of the formula



comprising (a) reacting 4-alkoxy-3-pyrrolin-2-one in an acid with benzyl alcohol to provide 4-benzyloxy-3-pyrrolin-2-one of the formula:



and (b) catalytically hydrogenolyzing the 4-benzyloxy-3-pyrrolin-2-one to provide the tetramic acid.

4,812,579

PROCESS FOR PRODUCING N-SUBSTITUTED MALEIMIDES

Shunichi Doi, and Yasuyuki Takayanagi, both of Yokohama, Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 778,709, Sep. 23, 1985. This application Oct. 13, 1987, Ser. No. 107,478

Claims priority, application Japan, Oct. 3, 1984, 59-206199

Int. Cl.[4] C07D *207/448, 207/452*

U.S. Cl. 548—548 **14 Claims**

1. A process for producing N-substituted maleimides which comprises heating maleic anhydride and an aromatic or aliphatic primary amine in the presence of an ion exchange resin in an organic solvent in the temperature range of 50° C. to 160° C. to effect cyclodehydration.

4,812,580

PROCESS FOR THE PREPARATION OF 4-PHENYLPYRROLE DERIVATIVES

Pierre Martin, Rheinfelden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

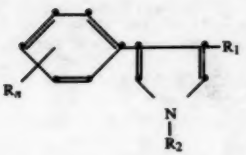
Division of Ser. No. 773,706, Sep. 9, 1985, Pat. No. 4,709,053. This application Sep. 4, 1987, Ser. No. 93,449

Claims priority, application Switzerland, Sep. 12, 1984, 4355/84

Int. Cl.[4] C07D *207/335*

U.S. Cl. 548—561 **14 Claims**

1. A process for the preparation of a 4-phenylpyrrole derivative of the formula I



(I)

wherein

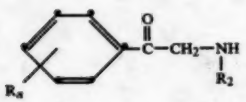
R_1 is CN,

R_2 is hydrogen,

R is halogen, C_{1-6}alkyl or C_1–C_6haloalkyl, and

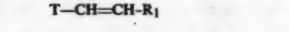
n is 0, 1 or 2,

which comprises reacting a phenacylamine of formula II



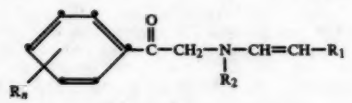
(II)

in the form of an acid addition salt of a hydrohalic acid, sulfuric acid or a sulfonic acid, in an inert solvent or mixture of solvents, in the temperature range from 0° to +120° C., with a compound of formula III



(III)

to give an intermediate of formula IV



(IV)

and cyclizing said compound of formula IV, at a temperature of 0° to +120° C., in an inert solvent or mixture of solvents, in the presence of an oxide, hydride, hydroxide, carbonate, carboxylic acid salt or alcoholate of an alkaline earth metal or of an alkali metal, a trialkylamine or a pyridine as base, to give a compound of formula I, in which formulae II, III and IV above, the substituents R_1, R_2 and R_n are as defined for formula I, T is a group selected from —OZ, —N(R_3)(R_4), —OCOR_a, —OSO$_2$$R_b$ or —SR_c,

where

Z is C_1–C_6alkyl, phenyl or phenyl which is substituted in the para-position by halogen or C_1–C_3alkyl, an alkali metal atom or an alkali earth metal atom, each of

R_a and R_b independently of the other is C_1–C_6alkyl, or phenyl which is unsubstituted or substituted by halogen or C_1–C_3alkyl,

R_c is C_1–C_3alkyl, C_1–C_3haloalkyl or phenyl which is unsubstituted or substituted by halogen or C_1–C_3alkyl,

and each of

R_3 and R_4 independently of the other is C_1–C_6alkyl or, together with the amine nitrogen atom, they form a pyrrolidine, piperazine, perhydrothiazine, morpholine, piperazine, oxazolidine, thiazolidine, imidazolidine or pyrazoline ring.

4,812,581

CATALYTIC HYDROGENOLYSIS

Pieter A. Verbrugge, and Jannetje de Waal, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 28, 1987, Ser. No. 115,004

Claims priority, application United Kingdom, Nov. 18, 1986, 8627493

Int. Cl.[4] C07D *205/04*

U.S. Cl. 548—953 **10 Claims**

1. A process for the preparation of azetidine-3-carboxylic acid or a salt thereof from N-benzylazetidine-3-carboxylic acid or a salt thereof, which comprises catalytically hydrogenating the N-benzylazetidine-3-carboxylic compound in the presence of water, formate ions, and ammonium and/or alkylammonium ions.

4,812,582

PROCESS FOR PREPARING ALDOL INTERMEDIATES

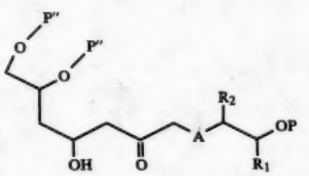
Stephen J. Nelson, County of Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 757,659, Jul. 22, 1985, Pat. No. 4,680,419. This application May 6, 1987, Ser. No. 47,230

Int. Cl.[4] C07D *317/26*; C07C *49/203, 49/17*

U.S. Cl. 549—214 **3 Claims**

1. A compound of the formula:



III'

wherein P is C_1–C_5 alkyl; benzoyl optionally substituted with one, 2 or 3 C_1–C_4 alkyl, C_1–C_3 alkoxy, halo, C_1–C_3 alkylthio, trifluoromethyl, nitro; phenyl(C_1–C_3)alkyl optionally substituted with one, 2 or 3 C_1–C_4 alkyl, C_1–C_4 alkoxy, halo, nitro or trifluoromethyl; C_2–C_6 alkoxyalkyl; C_2–C_6 alkylthioalkyl; C_1–C_6 alkanoyl; 2-tetrahydropyranyl; C_1–C_4 alkyl diphenyl silyl; di(C_1–C_4 alkyl) phenyl silyl; or tri(C_1–C_4)alkyl silyl;

wherein P'', being the same or different, are C_1–C_5 alkyl; benzoyl optionally substituted with one, 2 or 3 C_1–C_4 alkyl, C_1–C_3 alkoxy, halo, C_1–C_3 alkylthio, trifluoromethyl, nitro; phenyl(C_1–C_3)alkyl optionally substituted with one, 2 or 3 C_1–C_4 alkyl, C_1–C_4 alkoxy, halo, nitro or trifluoromethyl; C_2–C_6 alkoxyalkyl; C_2–C_6 alkylthioalkyl; C_1–C_6 alkanoyl; 2-tetrahydropyranyl; C_1–C_4 alkyl diphenyl silyl; di(C_1–C_4 alkyl) phenyl silyl; or tri(C_1–C_4)alkyl silyl; or optionally taken together to form a 1,3-dioxolane ring optionally substituted with one or two C_1–C_5 alkyl;

wherein A is —CH, —CH_2 or —CHOP';

wherein P' is C_1–C_5 alkyl; benzoyl optionally substituted with one, 2 or 3 C_1–C_4 alkyl, C_1–C_3 alkoxy, halo, C_1–C_3 alkylthio, trifluoromethyl, nitro; phenyl(C_1–C_3)alkyl optionally substituted with one, 2 or 3 C_1–C_4 alkyl, C_1–C_4 alkoxy, halo, nitro or trifluoromethyl; C_2–C_6 alkoxyalkyl; C_2–C_6 alkylthioalkyl; C_1–C_6 alkanoyl; 2-tetrahydropyranyl; C_1–C_4 alkyl diphenyl silyl; di(C_1–C_4 alkyl) phenyl silyl; or tri(C_1–C_4)alkyl silyl;

wherein is a single bond when A is —CH_2 or —CHOP' and a double bond when A is —CH; and

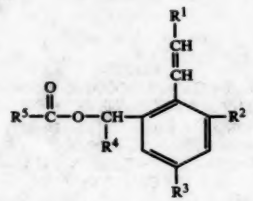
wherein R_1 and R_2, being the same or different, are hydrogen or C_1–C_5 alkyl.

4,812,583
SUBSTITUTED ACYLOXYALKYLPHENYLETHYLENE INHIBITORS OF 3-HYDROXY-3-METHYLGLUTARYL-COA REDUCTASE

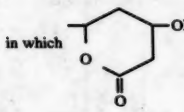
Thomas J. Commons, Wayne; Richard E. Mewshaw, King of Prussia, and Donald P. Strike, St. Davids, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Sep. 11, 1987, Ser. No. 95,800
Int. Cl.[4] C07D *309/30*
U.S. Cl. 549—292 6 Claims

1. A compound of the formula:



in which



where

M is hydrogen or alkyl of 1 to 4 carbon atoms;

R^2 and R^3 are, independently, alkyl of 1 to 6 carbon atoms;

R^4 is hydrogen, alkyl of 1 to 10 carbon atoms, trifluoromethyl, phenyl or substituted phenyl, where the substituent is alkyl of 1 to 8 carbon atoms, alkoxy of 1 to 8 carbon atoms, or trifluoromethyl; and

R^5 is alkyl of 1 to 10 carbon atoms, phenyl or substituted phenyl where the substituent is alkyl of 1 to 8 carbon atoms, alkoxy of 1 to 8 carbon atoms, or trifluoromethyl;

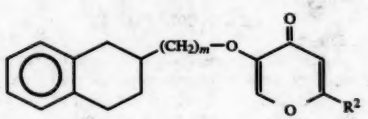
or a pharmaceutically acceptable salt thereof.

4,812,584
ARALKOXY AND ARYLOXYALKOXY KOJIC ACID DERIVATIVES

Miyano Masateru, Northbrook, and Robert L. Shone, Palatine, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 894,591, Aug. 8, 1986, Pat. No. 4,705,871, which is a division of Ser. No. 629,916, Jul. 11, 1984, Pat. No. 4,644,071. This application Jul. 24, 1987, Ser. No. 77,362
Int. Cl.[4] C07D *309/32*
U.S. Cl. 549—417 2 Claims

1. A compound of the formula:



wherein R^2 is:

(a) CH_2OH;

(b) CH=O; or

(c) $COOR^6$;

wherein R^6 is:

(a) hydrogen;

(b) alkyl of 1 to 6 carbon atoms, inclusive;

(c) alkali metal ion; or

(d) $R^7R^8R^9R^{10}N^+$;

wherein R^7, R^8, R^9, and R^{10}, each being the same or different, are:

(a) hydrogen; or

(b) alkyl of 1 to 6 carbon atoms, inclusive;

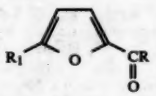
wherein m is an integer from 1 to 10, inclusive.

4,812,585
PROCESS FOR PRODUCING 2-ACEYLFURAN DERIVATIVES

Michitada Kondo, Kobe; Masayoshi Minai, Moriyama; Seiichi Kai, Nara; Takayuki Higashii, Kishiwada, and Yuji Ueda, Izumi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

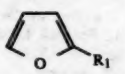
Filed Oct. 15, 1987, Ser. No. 108,467
Claims priority, application Japan, Oct. 28, 1986, 61-257637; Oct. 28, 1986, 61-257638
Int. Cl.[4] C07D *307/46*
U.S. Cl. 549—483 22 Claims

1. A process for producing 2-acylfuran derivatives represented by the formula;



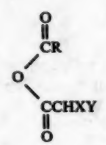
wherein R is an alkyl group having 1 to 18 carbon atoms, an alkenyl group having 3 to 8 carbon atoms, an alkynyl group having 3 to 8 carbon atoms, a cyclic alkyl group having 4 to 7 carbon atoms, phenyl group, a phenyl group having one or two substituents selected from the group consisting of alkyl groups having 1 to 5 carbon atoms, alkoxyl groups having 1 to 5 carbon atoms and halogen atoms, an aralkyl group having 7 to 12 carbon atoms, an alkyl group having 2 to 8 carbon atoms which has a substituent of an alkoxyl group having 1 to 5 carbon atoms, or an alkyl group having 2 to 8 carbon atoms which has a substituent of an alkoxycarbonyl group having 2 to 6 carbon atoms; and R_1 is hydrogen atom or a lower alkyl group,

which comprises reacting, in a solvent and in the presence of a boron trifluoride or a boron trifluoride complex catalyst, a furan compound represented by the formula;



(I)

wherein R_1 has the same meaning as defined above, with either (a) a mixed acid anhydride represented by the formula;



wherein R has the same meaning as defined above, X is hydrogen, chlorine or bromine atom, and Y is chlorine or bromine atom, or with

(b) a carboxylic acid represented by the formula;

RCOOH

wherein R has the same meaning as defined above, in the presence of an acid anhydride represented by the formula;

$(XYCHCO)_2O$

wherein X and Y have the same meanings as defined above.

4,812,586

PREPARATION OF GROUP II METAL ALKYLS

John B. Mullin, Worcestershire, Great Britain; John C. Hamilton, Fife, Scotland; Elisabeth D. Orrell, Cheshire; Philip R. Jacobs, Merseyside, both of Great Britain, and Deodattta V. Shenai-Khatkhate, Fife, Scotland, assignors to The Secretary of State for Defence in Her Britaanic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

PCT No. PCT/GB86/00197, § 371 Date Jan. 27, 1987, § 102(e) Date Jan. 27, 1987, PCT Pub. No. WO86/06071, PCT Pub. Date Oct. 23, 1986

PCT Filed Apr. 9, 1986, Ser. No. 948,348

Claims priority, application United Kingdom, Apr. 9, 1985, 8509055

Int. Cl.[4] C07F *3/06, 3/08*

U.S. Cl. 556—129 **15 Claims**

1. A method of preparing a metal alkyl of general formula MR^1R^2, in which M is selected from cadmium and zinc and R^1 and R^2 are independently selected from C_1–C_8 alkyl. which comprises the steps of

(a) forming an adduct of the metal alkyl with a Lewis base comprising a tertiary amine having at least two tertiary amino groups per molecule whose nitrogen atoms are capable of co-ordinating with M, and

(b) dissociating the adduct to liberate the metal alkyl at a pressure P and at a temperature below the sublimation temperature or boiling point of the tertiary amine at pressure P as the case may be, characterised in that the tertiary amine has a molecular structure whose nitrogen atoms, for geometric reasons, co-ordinate with different atoms M such that the adduct formed has a vapour pressure of less than 1.33 Pa at its dissociation temperature at that pressure.

4,812,587

PROCESS FOR SELECTIVE HYDROGENATION OF C—C DOUBLE BONDS IN THE PRESENCE OF REDUCIBLE, NITROGEN-CONTAINING GROUPS AND NEW RUTHENIUM COMPLEX COMPOUNDS

Paul Fiedler, Cologne; Rudolf Braden, Odenthal, and Hartmuth Buding, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 659,591, Oct. 11, 1984, Pat. No. 4,673,757. This application Jan. 29, 1987, Ser. No. 8,715

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1983, 3337294

Int. Cl.[4] C07F *15/00*

U.S. Cl. 556—136 **8 Claims**

1. A ruthenium complex compound of the formula

$$RuZL_3(L_4)_2$$

in which

Z represents chlorine, bromine, iodine or hydrogen,

L_3 represents a cyclopentadienyl, pentamethylcyclopentadienyl, ethyltetramethylcyclopentadienyl, pentaphenylcyclopentadienyl or dimethyltriphenylcyclopentadienyl and

L_4 represents a triorganophosphane ligand of the formula

in which

R_6, R_7 and R_8 can be identical or different and denote alkyl, cycloalkyl, aryl or aralkyl radicals, or alkyl, cycloalkyl, aryl or aralkyl substituted by alkyl, hydroxyl, alkoxy, carbalkoxy, or halogen, with the proviso that L_3 only represents an unsubstituted cyclopentadienyl ligand if L_4 represents a triarylphosphane ligand containing at least one phenyl ring carrying at least one inert substituent selected from alkyl, hydroxyl, alkoxy, carbalkoxy and halogen which is not methyl, or $(L_4)_2$ represents a bidentate bisphosphane ligand of the type $Ph_2P—(CH_2)_n—PPh_2$, whereby n represents an integer from 1 to 10 and Ph represents phenyl or phenyl substituted by alkyl, hydroxyl, alkoxy, carbalkoxy or halogen, with the proviso that L_3 only represents an unsubstituted cyclopentadienyl ligand if the bisphosphane ligand is not $(C_6H_5)_2—P—(CH_2)_2—P(C_6H_5)_2$.

4,812,588

POLYORGANOSILOXANE-BRIDGED BISBENZOCYCLOBUTENE MONOMERS

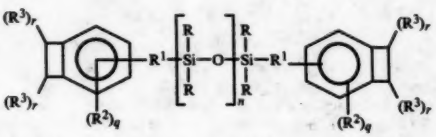
Alan K. Schrock, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 14, 1987, Ser. No. 132,734

Int. Cl.[4] C07F *7/08, 7/10*

U.S. Cl. 556—453 **6 Claims**

1. A bisbenzocyclobutene monomer represented by the formula:



each R is independently alkyl of 1 to 6 carbon cycloalkyl, aralkyl, or phenyl:

each R^1 is independently vinyl, allyl, or methallyl:

each R^2 is independently alkyl of 1 to 6 carbon atoms, methoxy, or chloro;

each R^3 is independently alkyl of 1 to 6 carbon atoms, chloro, or cyano:

n is an integer of 1 or more; and

each q and r is independently an integer of zero or 1.

4,812,589

POLYHYDROXYL COMPOUNDS CONTAINING A SULFONIC ACID ESTER GROUP

Klaus Prater, Krefeld; Walter Uerdingen; Heinrich Heine, both of Leverkusen, and Dieter Freitag, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 17, 1986, Ser. No. 908,435

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1985, 3534929

Int. Cl.[4] C07C *143/68*

U.S. Cl. 558—51 **3 Claims**

1. A process for the preparation of a polyhydroxyl compound which contains at lest one sulphonic acid ester group, said compound being characterized in having an average hydroxyl functionality of from 1.5 to 4 comprising

(i) reacting

(a) at least one paraffin sulphochloride which is obtained by sulphochlorination of a paraffin containing from 10 to 18 carbon atoms and having a saponifiable chlorine content based on the total weight of component (a), of from 5 to 15%

with

(b) an alcohol which is at least trihydric and which contains primary and/or secondary hydroxyl groups having a molecular weight of from 92 to 250 or with a mixture of polyhydric alcohols having molecular

weights of from 62 to 250 and an average hydroxyl functionality of from 2.5 to 5,

in the presence of a hydrogen chloride acceptor while maintaining an equivalent ratio of hydroxyl groups to sulphochloride groups of at lest 2:1, to form an organic phase which contains said polyhydroxyl compound,

(ii) dissolving said organic phase in a suitable solvent,

(iii) washing said phase with dilute acid and then with water and then dewatering said phase by azeotropic distillation and

(iv) removing said solvent by distillation.

4,812,590

CARBAMATES OF 4-HYDROXYANISOLE AS PRODRUGS FOR CHEMOTHERAPY OF MELANOMA

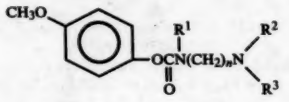
Walfred S. Saari, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 25, 1987, Ser. No. 66,153

Int. Cl.[4] C07C *125/067*

U.S. Cl. 860—137 **6 Claims**

1. A carbamate of 4-hydroxyanisole of the formula



wherein

n is 2 or 3;

R^1 is H or lower alkyl;

R^2 is H or lower alkyl; and

R^3 is H or lower alkyl;

wherein

R^1, R^2 and R^3 are the same or different;

or a physiologically acceptable salt thereof.

4,812,591

PROCESS FOR THE PREPARATION OF BISPHENOL-BISACRYLATES

Hans-Josef Buysch, and Werner Klöker, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 15, 1988, Ser. No. 232,232

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1987, 3728302

Int. Cl.[4] C07C *09/00*

U.S. Cl. 560—140 **6 Claims**

1. Process for the preparation of bisphenol-bisacrylates by the reaction of bisphenols with acrylic acid halides in the presence of bases, characterised in that the reaction is carried out in an apolar solvent in the presence of a tertiary amine and in the absence of an aqueous phase and the amine salts are subsequently removed by extraction with water while the bisphenol-bisacrylates are obtained in a crystalline form from the organic phase.

4,812,592

PROCESS FOR THE PREPARATION OF THE ESTERS OF AN ACID

Roberto Santi, Novara; Giuseppe Cometti, Verbania-Pallanza, and Anselmo Pagani, Trecate, all of Italy, assignors to Istituto Guido Donegani, S.p.A., Novara and Consiglio Nazionale Delle Ricerche, Rome, both of, Italy

Filed Jan. 8, 1987, Ser. No. 1,379

Claims priority, application Italy, Jan. 16, 1986, 19097 A/86

Int. Cl.[4] C07C *69/66*

U.S. Cl. 560—180 **26 Claims**

1. A process for the preparation of esters of an alkyl-tartronic acid, said esters having the formula (I):

(I)

wherein R is an alkyl or cycloalkyl group and wherein R′ and R″ are C_1–C_6 alkyl, by direct oxidation of the corresponding alkyl-malonic ester having the formula (II):

(II)

wherein R, R′ and R″ are as above defined, characterized in that the oxidation is carried out at 30°–200° C. in the presence of an oxygen-containing gas and with a catalytic system comprising:

(a) an inorganic or organic salt of a transition metal selected from the group consisting of manganese, iron, cobalt and copper; and

(b) an alkali-metal salt of an aliphatic carboxylic acid in a catalytic amount not greater than 60 moles per mole of transition metal.

16. A process for the preparation of esters of an alkyl-tartronic acid, said esters having the formula (I):

(I)

wherein R is an alkyl or cycloalkyl group and wherein R′ and R″ are C_1–C_6 alkyl, by direct oxidation of the corresponding alkyl-malonic ester having the formula (II):

(II)

wherein R, R′ and R″ are as above defined, characterized in that the oxidation is carried out at 30°–200° C. in the presence of an oxygen-containing gas and with a catalytic system consisting essentially of an organic salt of a transition metal selected from the group consisting of manganese, iron, cobalt, and copper.

4,812,593

PREPARATION OF BIFUNCTIONAL COMPOUNDS

Wolfgang Hoelderich, Frankenthal; Norbert Goetz, Worms, and Leopold Hupfer, Friedelsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

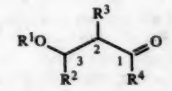
Filed Aug. 6, 1987, Ser. No. 82,127

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1986, 3629119; Jan. 16, 1987, 3701113

Int. Cl.[4] C07C *69/73*

U.S. Cl. 560—183 **12 Claims**

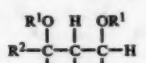
1. A process for the preparation of a bifunctional compound of the formula (I)



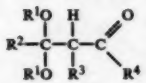
(I)

where R^1, R^2, and R^3 are each alkyl of 1–6 carbon atoms, R^2

and R^3 may furthermore be hydrogen, R^2 may furthermore be alkoxy and R^4 is hydrogen, alkyl of 1–6 carbon atoms or alkoxy, and a double bond may be present between carbon atoms 2 and 3, wherein a tetra-alkoxyalkan of the formula (11) or a dialkoxyalkanoate of the formula (III)



(II)



(III)

where R^1, R^2, R^3 and R^4 have the above meanings, is converted in the presence of a zeolite as a catalyst.

4,812,594

PROCESS FOR PURIFICATION OF CRUDE P-HYDROXYMETHYLBENZOIC ACID

Bruce Petty-Weeks, West Chicago, Ill., assignor to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 40,895, Apr. 21, 1987. This application Sep. 8, 1987, Ser. No. 93,911

Int. Cl.[4] C07C *65/00*

U.S. Cl. 562—473 **6 Claims**

1. A method for purification by hydrogenation of p-hydroxymethylbenzoic acid containing impurities comprising 4-carboxybenzaldehye which comprises the steps of:

(a) preparing a basic solution of said crude p-hydroxymethylbenzoic acid compound in a polar solvent wherein pH of said solution is greater than 7 to solubilize said compound;

(b) passing hydrogen through said solution in the presence of a nickel catalyst upon a substrate of active kieselguhr in the form of granules having a surface area of at least about 600 m^2/g (N_2; BET Method), at a temperature of up to 75° C.;

(c) recovering said nickel catalyst by separation from said solution; and

(d) separating said p-hydroxymethylbenzoic acid from said solution by cooling said solution to effect crystallization.

4,812,595

ALKYLATION OF AMINE COMPOUNDS

Kuo-Hua Chao, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 23, 1987, Ser. No. 111,953

Int. Cl.[4] C07C *85/00, 85/24*

U.S. Cl. 564—463 **12 Claims**

1. A process for the oligomerization of alkylamines to produce longer carbon chain alkylamines which process comprises contacting said alkylamines at a temperature of from about 50° C. to about 300° C. with a catalyst mixture comprising a quaternary ammonium halide and a component selected from a ruthenium carbonyl, a ruthenium-containing compound capable of being converted to a carbonyl under oligomerization conditions and mixtures thereof.

4,812,596

PROCESS FOR THE CONVERSION OF T-ALKYLPHENOL WASTE DISTILLATION BOTTOMS TO PARA-T-ALKYLPHENOL

Altaf Husain, East Norriton, and Stanley R. Sandler, Springfield, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Mar. 31, 1987, Ser. No. 32,890

Int. Cl.[4] C07G *37/11*; C07C *37/68*

U.S. Cl. 568—788 **17 Claims**

1. A process for reducing unknown constitutuents in waste distillation bottoms comprising a substantial proportion of unknown constituents, the waste distillation bottoms resulting from the production of a t-alkylphenol, and for substantially simultaneously producing a predominant amount of para-t-alkylphenol from the waste distillation bottoms comprising reacting with the waste distillation bottoms about 13 wt. % to about 50 wt. % phenol in the presence of about 3 wt. % to about 11 wt. % free acid catalyst available to catalyze the reaction, the acid catalyst being selected from the group consisting of Bronsted and Lewis acids, and maintaining an average reaction temperature of about 80° C. to about 130° C.

4,812,597

DEHYDROGENATION OF DEHYDROGENATABLE HYDROCARBONS

Tamotsu Imai, Mount Prospect, and Jeffery C. Bricker, Buffalo Grove, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Sep. 2, 1987, Ser. No. 92,355

Int. Cl.[4] C07C *5/48*

U.S. Cl. 585—443 **17 Claims**

1. In a process for the dehydrogenation of a dehydrogenatable hydrocarbon with separate and intermediate selective oxidation of hydrogen which comprises the steps of:

(a) contacting said hydrocarbon with a dehydrogenation catalyst comprising an alkaline metal-promoted iron compound in a first-reaction dehydrogenation zone in the presence of steam at dehydrogenation conditions to produce a first-reaction dehydrogenation zone effluent stream comprising a mixture of dehydrogenated hydrocarbons, unconverted hydrocarbons, hydrogen and steam;

(b) removing said first-reaction dehydrogenation zone effluent stream from said first-reaction dehydrogenation zone;

(c) passing said effluent stream of step (b) to a second-reaction oxidation zone which is separate and discrete from said first-reaction dehydrogenation zone;

(d) contacting said first reaction dehydrogenation zone effluent in said second-reaction oxidation zone with an oxygen-containing gas in the presence of an oxidation catalyst consisting essentially of group VIII noble metal, a Group IVA metal and a group IA or IIA metal composited on an alumina support at oxidation conditions to selectively oxidize said hydrogen within said first-reaction zone effluent to the substantial exclusion of oxidation of said unconverted and dehydrogenated hydrocarbons, wherein said exothermic selective oxidation of said hydrogen provides additional heat and thereby raises the temperature of said unconverted and dehydrogenated hydrocarbons;

(e) withdrawing said unconverted and dehydrogenated hydrocarbons from said second-reaction oxdiation zone having an increased temperature with respect to the temperature of said first-reaction dehydrogenation zone effluent;

(f) passing said second-reaction oxidation zone product stream of step (e) to a third-reaction dehydrogenation zone containing a dehydrogenation catalyst comprising an alkaline metal-promoted iron compound at dehydrogenation conditions to produce dehydrogenated hydrocarbons; and,

(g) withdrawing and recovering said dehydrogenated hydrocarbons,

the improvement of which cmmprises utilizing as said oxidation catalyst an alumina support onto which the Group

VIII noble metal has been surface impregnated, said Group VIII noble metal being present in the exterior surface of said alumina support of said oxidation catalyst in an average concentration of at least 10% higher than the Group VIII noble metal average concentration present in the core of said support, said exterior surface of said alumina support possessing a depth in the range of from about 10 to about 300 microns.

4,812,598

GAS PERMEABLE CONTACT LENS AND METHOD AND MATERIALS FOR ITS MANUFACTURE

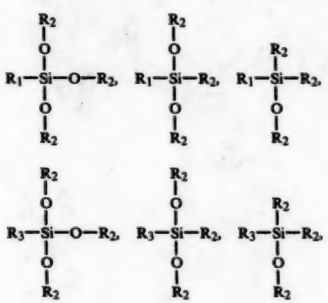
Richard Y. S. Chen, Raleigh, N.C., assignor to Ocular Technologies, Inc., Raleigh, N.C.

Filed Jun. 18, 1987, Ser. No. 63,312

Int. Cl.[4] C08F *30/08*

U.S. Cl. 523—107 **5 Claims**

1. A contact lens made of a polymer comprising 0% to 30% by weight of a hydrophilic agent, 0.1% to 5% by weight of a cross linker, 0.05% to 1.0% by weight of a polymerization initiator, and 2% to 94.85% by weight of a polymerizable silicone monomer selected from the group consisting of



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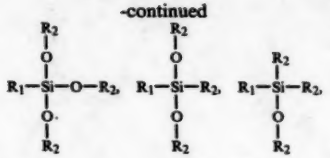
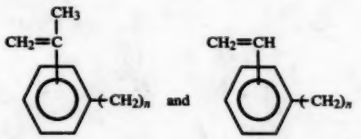


and mixtures thereof, where

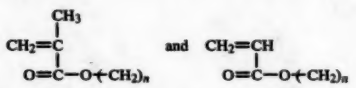
R_1 is selected from the group consisting of



where n=1 to 6, and mixtures thereof,

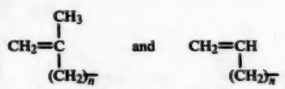
R_2 is selected from the group consisting of an alkyl group having from 1 to 8 carbon atoms, a saturated cyclic group and a benzene ring, and mixtures thereof,

R_3 is selected from the group consisting of



where n=1 to 6, and mixtures thereof, and

R_4 is selected from the group consisting of



where n=1 to 6, and mixtures thereof, and said lens being transparent, hard, machinable and oxygen permeable.

4,812,599

INBRED CORN LINE PHV78

Robert L. Segebart, Shelbyville, Ill., assignor to Pioneer Hi-Bred International, Inc., Johnston, Iowa

Filed Jan. 27, 1988, Ser. No. 148,893

Int. Cl.[4] A01H *1/06*

U.S. Cl. 800—1 **12 Claims**

1. An inbred corn line designated PHV78.

4,812,600

INBRED CORN LIKE PHK29

Stanley D. Jensen, and Norman E. Williams, both of York, Nebr., assignors to Pioneer Hi-Bred International, Inc., Johnston, Iowa

Filed Jan. 27, 1988, Ser. No. 148,892

Int. Cl.[4] A01H *1/06*

U.S. Cl. 800—1 **12 Claims**

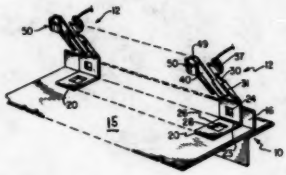
1. An inbred corn line designated PHK29.

4,812,601

ELECTRICAL TERMINAL

Freimuth Lothar, Franklin Lakes, N.J., assignor to Magnetek, Inc., Peterson, N.J.

Filed Oct. 20, 1987, Ser. No. 111,044
Int. Cl.[4] H01R *4/00*
U.S. Cl. 174—94 R 9 Claims



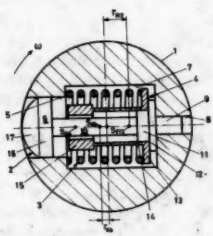
1. A terminal of electrically conductive material comprising:
a generally rectangular base portion,
first and second elongated arms lying generally parallel to each other and extending in the same direction from said base portion, said arms being spaced apart with one of said arms being longer than the other,
a notch formed adjacent the free end of one of said arms to accept a wire of a first diameter to be wound around and soldered to said one arm,
a tubular pocket formed at the free end of the other and longer of said arms for accepting and having soldered thereto a wire of a larger diameter than said first diameter, and
said base portion of said terminal serving as a heat sink when heat is applied to one of said arms to prevent the wire connected to the other of said arms from becoming detached.

4,812,602

SPRING-LOADED CENTRIFUGAL SWITCH ELEMENT

Rico Plangger, Turgi, and Kamil Prochazka, Windisch, both of Switzerland, assignors to BBC Brown Boveri AG, Baden, Switzerland

Filed Apr. 14, 1988, Ser. No. 181,378
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1987, 3713353
Int. Cl.[4] H01H *35/10*
U.S. Cl. 200—80 R 3 Claims



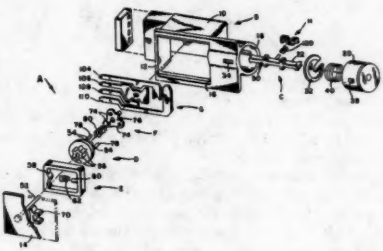
1. A spring-loaded centrifugal switch element, with a release bolt (2) having coaxially relative to one another a release head (6), a shank (10), a collar (12) serving as a spring support, and a guide pin (9), the release bolt (2) being mounted displaceably by means of its release head (6) and the guide pin (9) in two radial guides (5 and 8) of a shaft (1) and being loaded radially inwards by a helical spring (3) clamped between a bearing surface integral with the shaft and the collar (12) of the spring support of the release bolt (2), wherein there is a compensating bush (4) surrounding the release bolt (2) coaxially, wit a compensating ring (15) located on the same side as the release head (6) in relation to the axis of the shaft (1), with a spring plate (13) located on the opposite side of the shaft (1) and supported on the collar (12), and with a hub tube (14) connecting the compensating ring (15) to the spring plate (13), the center of gravity (S_{Kb}) of the compensating bush (4) being on the same side as the release head (6), and the helical spring (3) being clamped between the spring plate (13) and the said bearing surface integral with the shaft and being arranged half on one side of the shaft axis and half on the other.

4,812,603

DIMMER SWITCH

Donald J. Coleman, University Heights, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 919,997, Oct. 17, 1986, abandoned.
This application Feb. 12, 1988, Ser. No. 158,059
Int. Cl.[4] H01H *13/66*
U.S. Cl. 200—570 6 Claims



1. A switch comprising:
a housing;
actuating means mounted for selective advance and retract reciprocating movement relative to said housing for effecting switch actuation;
means biasing said actuating means in said retract direction;
cam means rotatably mounted in said housing and including ratchet means, said cam means selectively engaged with a first end of said actuating means and rotated in one direction upon said reciprocating movement;
a substantially rigid first wiper operatively associated with said cam means;
cam follower means movably guided for sliding movement mounted in said housing and operative to provide over-center snap action for rotation of said cam, said cam follower means including a member having a pair of spaced parallel guide surfaces guided for said sliding movement by said housing with said cam means disposed between said guide surfaces and including detent means operative to engage said ratchet means and urge said cam means to an at-rest position;
bias means disposed on the opposite side of said ratchet means from said detent means and operative to urge said cam follower means in a direction of said sliding movement to maintain contact with said cam means;
means defining a plurality of stationary contact portions adapted for selective electrical interconnection by said substantially rigid first wiper, said first wiper upon rotation being operative to complete electrical connection with selected one of said contact portions before it breaks electrical connection with selected other contact portions; and,
said actuating means, upon said advance movement, being operative to move said cam means to cause said completion of electrical connection of said selected ones of said contact portions, before said over-center snap action occurs, and operative upon continued movement to cause said over-center snap action to break the electrical connection of said other contact portions, said movement of

said cam means after said over-center snap action being independent of movement of said actuating means.

4,812,604

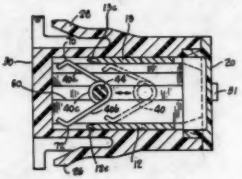
TORSION SPRING CONTACT SWITCH

William A. Howard, Burton, Ohio, assignor to Delta Systems, Inc., Streetsboro, Ohio

Filed Dec. 10, 1987, Ser. No. 131,119

Int. Cl.[4] H01H *13/52*

U.S. Cl. 200—260 **9 Claims**



1. A switch assembly comprising:

(a) a switch housing defining a housing interior bounded in part by a housing end wall defining a throughpassage into the housing interior;

(b) two conductive switch contacts mounted to the switch housing and defining two spaced apart parallel contact surfaces fixed within the housing interior;

(c) a switch actuator supported within the housing interior for movement along a travel path generally parallel to the parallel contact surfaces of the switch contacts and including an activating portion extending through the end wall throughpassage for actuating the switch;

(d) biasing means positioned within the housing interior to exert a force on the switch actuator tending to move said switch actuator to a normal position with the actuating portion extending beyond an outer surface of the end wall; and

(e) an electrically conductive torsion spring carried by the switch actuator for bridging a gap between said contact surfaces, said torsion spring having a coiled center portion contacting said switch actuator and two elongated arms extending from the coiled center portion and bent along their length to form contact regions that slide against said spaced apart parallel contact surfaces as the switch actuator moves along its travel path.

4,812,605

ELECTRIC SWITCH HOUSING WITH DUST TIGHT CHAMBER CAPTIVATING WIRE TERMINATION SCREWS

Jackson H. Smith, Union Grove, Ala., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 19, 1988, Ser. No. 144,903

Int. Cl.[4] H01H *1/64*

U.S. Cl. 200—284 **13 Claims**

1. Electrical apparatus comprising:

an insulating housing having an interior cavity;

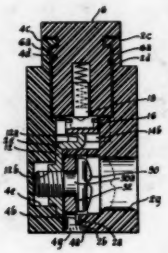
a wiring terminal enclosed by said cavity having a threaded opening therein;

a screw disposed within said cavity threadably received in said threaded opening, said screw having a tool receiving recess in one end and axially fixed transversely disposed clamping means adjacent said one end;

a first opening in said housing communicating with said cavity through which a wire conductor is inserted between said terminal and said clamping means;

a second opening in said housing communicating with said cavity axially aligned with said screw and through which a tool is engagable within said recess; and

abutment means in said cavity comprising an interior surface of a wall of said housing defining said cavity and containing said second opening engaged by said clamping means



preventing removal of said screw through said second opening.

4,812,606

MICROWAVE OVENS FOR COOKING PRIMARILY MEAT ITEMS

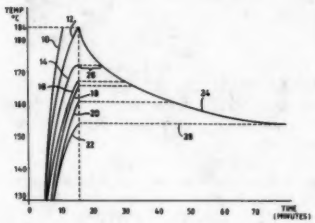
Kenneth I. Eke, South Croydon, England, assignor to Microwave Ovens Limited, Shirley, England

Filed Jun. 4, 1987, Ser. No. 58,128

Claims priority, application United Kingdom, Jun. 4, 1986, 8613553

Int. Cl.[4] H05B *6/68*

U.S. Cl. 219—10.55 B **15 Claims**



1. A microwave oven which comprises:

a food-receiving cavity; a magnetron for delivering microwave power to said cavity; a forced hot air system including an electrical resistance heating element and thence through said cavity simultaneously with the production of microwave power; a first means for sensing the temperature of the air flow exiting said cavity; a timing means for timing cooking from the commencement of cooking with said cavity in a cold condition; control meant for controlling the operation of said magnetron and said forced air system; said control means operative to (1) sense the temperature in said cavity at a predetermined time after commencement of cooking, (2) determine the further cooking time interval beyond said predetermined time in accordance with a predetermined characteristic relating sensed temperature at said predetermined time to the requisite further cooking time, and (3) cease production of microwave power and power to said heating element after the further cooking time interval has elapsed to terminate cooking; said predetermined characteristic relating said sensed temperature at said predetermined time to said further cooking time interval having been determined empirically and having been preloaded into said control means; said temperature sensed at said predetermined time governing the thermostatic control of said forced hot air system so that the maximum air temperature during said

further cooking time interval decreases as said further cooking time interval increases; and a second temperature sensing means comprising a thermistor located to monitor air temperature immediately downstream of said heating element during said further cooking time interval to prevent the hot air temperature from reaching undesirable high levels.

4,812,607

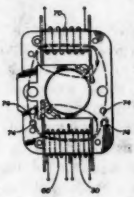
COMPENSATION FOR IMPROVED CONTINUOUS TRANSFORMER AND MOTOR

Jeffrey K. Cornell, Memphis, Tenn., assignor to Microwave Products of America, Inc., Memphis, Tenn.

Continuation-in-part of Ser. No. 68,243, Jun. 30, 1987, Pat. No. 4,757,171, which is a continuation-in-part of Ser. No. 860,632, May 7, 1986. This application Sep. 2, 1987, Ser. No. 92,074

Int. Cl.[4] H05B 9/06

U.S. Cl. 219—10.55 B **45 Claims**



1. A transmotor for providing an output voltage proportional to an input voltage and for providing a selectively driven rotatable shaft, said transmotor comprising, in combination:

(a) a magnetic flux conducting structure having first and second flux conducting paths therethrough;

(b) a first winding operatively coupled to the first flux conducting path of the flux conducting structure and continuously connected to a source of input voltage for inducing flux in the first flux conducting path of the magnetic flux conducting structure;

(c) a second winding operatively coupled to the second flux conducting path and selectively connectable to the source of input voltage to thereby induce flux therein;

(d) a third winding operatively coupled to receive flux from either the first or the second flux conducting path to produce an output voltage;

(e) a motor rotor mounted on the flux conducting structure for receiving flux conducted in the first and second flux conducting paths, said rotor constructed and arranged for rotation when the second winding is connected to a source of input voltage and for remaining stationary when the second winding is not connected to a source of input voltage; and

(f) compensating winding means wound in a sense to provide flux opposite in polarity to the second winding for reducing changes in the flux in that portion of the flux conducting structure encircled by the third winding.

4,812,608

OVEN FOR THERMO-MAGNETIC TREATMENT OF TOROIDAL COILS OF AMORPHOUS FERRO-MAGNETIC RIBBON MATERIAL

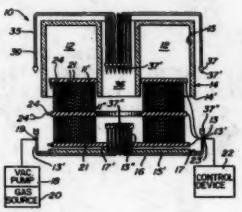
Nicolas Alexandrov, St-Bruno; Normand Chrétien, and Jean-Luc Fihey, both of Ste-Julie, all of Canada, assignors to Hydro-Quebec, Quebec, Canada

Filed Mar. 22, 1988, Ser. No. 171,809

Int. Cl.[4] H05B 6/10

U.S. Cl. 219—10.75 **12 Claims**

1. An oven for thermo-magnetic treatment of toroidal coils of amorphous ferro-magentic ribbon material to improve the eddy current and hysteresis losses thereof for utilization in a distribution transformer construction, said oven comprising a housing formed as an annular chamber defined by a base portion and a detachable cover portion, a thermo insulating material disposed over an interior surface of said base and cover portions, said annular chamber defining an open-ended central vertical passage, a coil of electrically conductive wire disposed about said chamber and extending about the vertical cross section of said chamber through said central vertical passage to encircle said base and cover portions all along said annular chamber, said coil of conductive wire being separable by detachable connector means to permit said cover portion to be detached from said base portion, at least two annular support heater discs inside said annular chamber and between which a coil of said amorphous ribbon material may be disposed for heating the toroidal windings of said ribbon material from the end edges thereof, means to apply controlled heat to said heater discs, and means to apply a current to said coil of electrically conductive wire to generate a controlled magnetic field about said chamber to orient the ferromagnetic domains in said amorphous ribbon material when positioned in said chamber.



4,812,609

DEVICE FOR HEATING A PRODUCT BY MEANS OF DIELECTRIC HIGH FREQUENCY HEATING

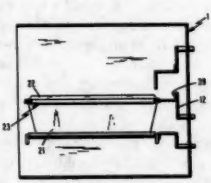
Lucas A. Butot, Amsterdam, Netherlands, assignor to I.K. International B.V., Netherlands

Filed Mar. 10, 1987, Ser. No. 24,064

Claims priority, application Netherlands, Nov. 21, 1986, 8602956

Int. Cl.[4] H05B 6/54

U.S. Cl. 219—10.81 **4 Claims**



1. A device for heating a product contained within a tray, comprising:

a housing having a housing wall and a housing interior;

at least one contact projecting into the housing interior through the housing wall;

at least first and second electrodes and means for connecting said electrodes to a high frequency alternating current supplied to the electrodes through said at least one contact; and

means for mounting at least one of the first and second electrodes such that in a heating position said at least one of the first and second electrodes extend into the tray interior into intimate contact with the product, and wherein said at least one of the first and second electrodes includes element means for providing electrical connec-

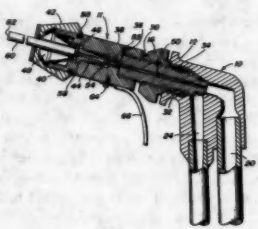
tion between said at least one of the first and second electrodes and the contact when the tray containing said at least one of the first and second electrodes is positioned in the housing interior at a predetermined position, wherein said first electrode is plate shaped and includes peripheral portions defining a lip adapted to engage an upper peripheral edge of the tray and wherein a major portion of said first electrode extends below the lip in the direction of the tray bottom.

4,812,610

ADAPTOR FOR CONVERTING OXY-FUEL CUTTING TORCHES TO EXOTHERMIC CUTTING

Paul E. Moore, Glouster, Ohio, assignor to Arcair Company, Lancaster, Ohio

Filed Mar. 9, 1987, Ser. No. 23,335
Int. Cl.[4] B23K 9/28
U.S. Cl. 219—70 **7 Claims**



1. An apparatus for performing exothermic cutting comprising in combination:

an oxy-fuel cutting and welding torch, said torch including a head;

an exothermic cutting electrode;

a collet nut adaptor connected to said head of said oxy-fuel torch and adapted to receive and hold said exothermic electrode for performing a cutting operation; said collet nut adaptor including means to pass oxygen from said torch to said electrode; and said collet nut adaptor further including terminal means to facilitate supply of electricity to said electrode from an electrical power source.

7. An adaptor for permitting a conventional oxy-fuel torch to be used for exothermic cutting comprising in combination:

an elongated generally cylindrical electrically conductive body;

a first end of said body provided with first means to removably secure said adaptor to said oxy-fuel torch said first means constructed to conduct oxygen from said torch to the interior of said cylindrical body and being in the form of the torch end of said oxy-fuel torch;

a second end of said body having means to hold a collet axially aligned to said second end of said body to removably hold one end of a generally elongated exothermic cutting electrode having at least one passage therethrough to conduct oxygen from said torch to said electrode, said collet including means to positively seal one end of said electrode to said cylindrical bore in said body;

second means on said body to permit said body to be connected to a source of electrical current in order to conduct electrical current through said body to said electrode; and

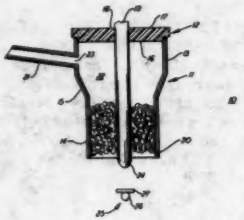
means in said body to prevent flashback into said torch said means positioned between said electrode holding means and said first end of said body.

4,812,611

GAS FLOW DEVICE FOR WELDING ELECTRODE

Samuel A. Carleton, Bath, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 20, 1985, Ser. No. 811,625
Int. Cl.[4] B23K 9/16
U.S. Cl. 219—74 **6 Claims**



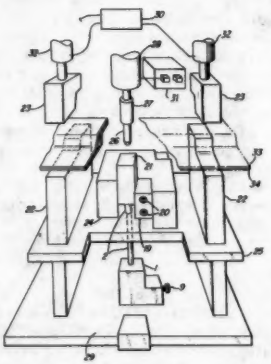
1. A gas flow device for directing inert gas around a welding electrode and onto a workpiece, the device comprising: a metal sleeve having a forward opening and a rearward opening, the sleeve dimensioned to create a concentric chamber surrounding the tip portion of a welding electrode; an insulating cap covering the rearward opening of the sleeve and having a central aperture dimensioned to force fit onto the electrode; means for introducing an inert gas into the chamber in the vicinity of the rearward opening of the sleeve; and a quantity of metal wool to fill the portion of the chamber in the space between the forward portion of the sleeve and the electrode; whereby inert gas introduced into the chamber during welding is forced to flow along the electrode, through the wool and onto an adjacent workpiece to be welded.

4,812,612

HYDRAULIC LOCK FOR RESISTANCE WELDERS

E. James Perkins, Clarkston, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jan. 11, 1988, Ser. No. 142,583
Int. Cl.[4] B23K 11/30
U.S. Cl. 219—89 **4 Claims**



1. In a resistance welding machine for performing welding operations, with a stationary electrode and a variable electrode, an apparatus for locating the position of the stationary electrode to a stationary position prior to the welding operation, comprising:

a housing;

an actuated piston extending from the housing and connected to the stationary electrode for locating the position of the stationary electrode to the stationary position prior to the welding operation;

a motive piston within the housing;

means for varying the position of the motive piston attached to the housing;

a passage between the motive piston and the actuated piston;

incompressible hydraulic fluid completely filling the passage such that movement of the motive piston will cause displacement of hydraulic fluid which moves the actuated piston thereby locating the stationary electrode to the stationary position prior to the welding operation and also thereby forming a hydraulic lock as a result of the incompressibility of the hydraulic fluid to prevent movement of the stationary electrode while resisting forces applied by the variable electrode during the welding operation.

4,812,613

BEAM GUIDING OPTICAL SYSTEM FOR LASER RADIATION

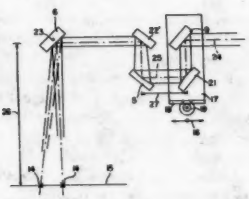
Wolfram Gorisch, Aschaffenburg, Fed. Rep. of Germany, assignor to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Jan. 13, 1988, Ser. No. 143,965

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1987, 3709351

Int. Cl.[4] B23K *26/06*

U.S. Cl. 219—121.74 **11 Claims**



1. A beam guiding optical system for laser radiation, especially for the radiation of a medical laser, for the stepless variation of the focal length, comprising:

adjusting means acting on parts of the beam guiding optical system, said adjusting means comprising a linearly movable carriage which bears at least two carriage mirrors disposed with respect to one another, at least one of these carriage mirrors being concavely or convexly curved;

an entry beam falling on a mirror having a beam axis which is parallel to a beam axis of a beam emerging from said adjusting means, and said carriage having an axis of displacement being aligned parallel to the beam axis of the entry and emerging beams;

at least one deflecting mirror being disposed in a beam path outside of said adjusting means, which has a carriage mirror of a curvature complementary to the curvature of said at least one curved carriage mirror, the mirrors of complementary curvature, which are surface elements of solids of rotation of conic sections, being aligned with one another such that the corresponding focal points of the at least one deflecting mirror in the beam path outside said adjusting means lie in the plane which is spanned by the incident and reflected beam of said at least one deflecting mirror.

4,812,614

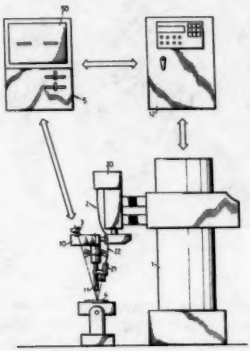
MACHINE VISION SEAM TRACKING METHOD AND APPARATUS FOR WELDING ROBOTS

Tzay-Chyuan Wang, and Cheng-Show Guu, both of Hsin Chu Hsien, Taiwan, assignors to Industrial Technology Research Institute, Hsin Chu Hsien, Taiwan

Filed Feb. 26, 1987, Ser. No. 19,073

Int. Cl.[4] B23K *9/12*

U.S. Cl. 219—124.34 **9 Claims**



1. A method for operating a machine vision seam tracking apparatus for welding robots having a light projector, a welding torch and electronic photographic means arranged above a workpiece having a welding seam, the method comprising the steps of:

positioning and maintaining the positions of the light projector, the welding torch and the electronic photographic means such that the projector and the photographic means are disposed at opposite sides of the welding torch and are located above the welding seam, and such that the angle formed between the axes of the projector and the welding torch is equal to the angle formed between the axes of the photographic means and the welding torch, where the axes of the photographic means, the welding torch and the projector intersect at one point on the welding seam and beneath the welding torch;

projecting onto the workpiece, utilizing the light projector, a line of light perpendicular to the welding seam, said line of light having two light spot segments;

detecting an image of said welding seam using the electronic photographic means; and

processing the image with a microcomputer to determine the location of the actual welding seam and detect any deviation between the actual welding seam and a taught welding path for correcting the welding path.

4,812,615

ELECTRIC HEATING ARRANGEMENT FOR A HYGROMETRIC SENSOR OF AN AUTOMATICALLY CONTROLLED CIRCUIT

Bernard Manzoni, Saint-Claude, France, assignor to Societe Anonyme: Manzoni-Bouchot, France

Filed Jul. 20, 1987, Ser. No. 75,110

Claims priority, application France, Jul. 24, 1986, 8610768

Int. Cl.[4] H05B *1/02, 3/00*; B60S *1/08*; H01L *7/00*

U.S. Cl. 219—209 **7 Claims**

1. A hygrometric sensor for automatically controlling electrically operated devices that are electrically connected to an electronic control circuit, comprising:

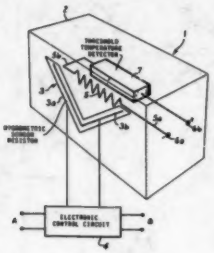
a support base;

an electrical resistor located on said support base, said electrical resistor have resistivity which changes with respect

to changes in humidity, said electrical resistor being electrically connectable to the electronic control circuit of an electrically operated device;

an electrically operated resistive heater in said support base for heating said support base and said electrical resistor, said electrically operated resistive heater being connectable to a source of electrical energy having substantially constant voltage; and

a threshold temperature detector located in said support base



proximate said electrical resistor, said threshold temperature detector being electrically connected in series with said electrically operated resistive heater for regulating said electrical energy to said electrically operated resistive heater, said threshold temperature detector regulating said electrical energy to said electrically operated resistive heater to maintain said support base and said electrical resistor below a predetermined temperature such that said hygrometric sensor is not damaged by heat produced by said electrical resistor.

4,812,616

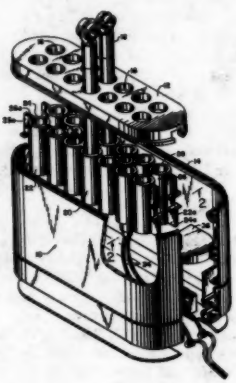
APPARATUS FOR ELECTRICALLY HEATING SOFT ROLLER HAIR CURLERS

Andrew M. P. Hong, Room 7, 13/F, Block D, Hilton Plaza, Shatin, N.T. Kowloon, Hong Kong

Filed Mar. 5, 1987, Ser. No. 22,345

Int. Cl.[4] A45D *2/18, 4/12;* H05B *3/00*

U.S. Cl. 219—222 **11 Claims**



1. A heater for roller hair curlers comprising two spaced pairs of side-by-side elongated, juxtaposed heat transmitting plates, the two plates of each of said pairs being connected to each other in heat transmitting relationship to form a closed heat transmitting path and being so shaped and configured that a plurality of individual pockets are formed therebetween for receiving respective roller hair curlers to be heated, and at least one heating element positioned in the space between said two pairs of heat transmitting plates and in heat conductive engagement with the confronting plates thereof, the width of said plates being less than the length of the curlers so that the opposite ends of the roller hair curlers extend beyond the edges of said plates and are not heated thereby.

4,812,617

COOLING SYSTEM FOR COOLING ELECTRICAL PARTS FOR MICROWAVE OVEN

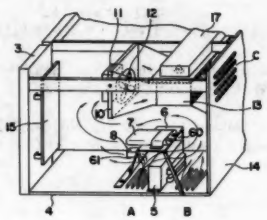
Koichi Takeuji, Kitakatsuragi, and Takashi Furusawa, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 343,902, Jan. 29, 1982, abandoned, which is a continuation of Ser. No. 127,850, Mar. 6, 1980, abandoned. This application Dec. 20, 1982, Ser. No. 451,254

Claims priority, application Japan, Mar. 6, 1979, 54-28804[U]

Int. Cl.[4] H05B *6/80*

U.S. Cl. 219—10.55 R **6 Claims**



1. A microwave oven containing an air cooling system for electronic components disposed therein comprising:

an outer housing;

a magnetron and a transformer, which generate high temperature heat when actuated, said magnetron being positioned within said outer housing and said transformer being positioned on a part of said outer housing;

a fan means for circulating air within said outer housing;

ventilation means formed in the outer housing on opposite sides of said transformer, for obliquely drawing cooling air into said housing toward and around the transformer, said fan means drawing air through said ventilation means for cooling the opposite sides of said transformer, and said magnetron being exposed to air circulated by said fan means, and

screen plate disposed adjacent the ventilation means on one side of the transformer, said screen plate means extending from said outer housing toward the transformer for further directing cooling air toward the transformer on one side thereof.

4,812,618

ELECTRODE BOILER AND AN INSULATOR THEREFOR

Albert Kunzli, Wiesendangen, and Kurt Schutz, Winterthur, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jun. 3, 1987, Ser. No. 57,483

Claims priority, application Switzerland, Jun. 18, 1986, 2462/86

Int. Cl.[4] H05B *3/60*

U.S. Cl. 219—288 **10 Claims**

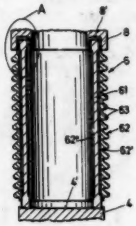
1. An electrode boiler comprising

a vessel for receiving a supply of water;

at least one electrode in said vessel for heating said water therein;

means for connecting said electrode to an alternating-current power supply; and

an electrical insulator mounting said electrode in said vessel,



said insulator including an electrically insulating hollow moulding of fluoroplastic material having a longitudinal axis and a support member for transmitting mechanical forces extending in said moulding parallel to said axis.

4,812,619

ELECTRODE BOILER AND AN INSULATOR THEREFOR

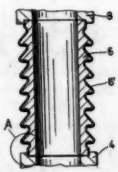
Albert Kunzli, Wiesendangen, and Kurt Schutz, Winterthur, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jun. 3, 1987, Ser. No. 57,488

Claims priority, application Switzerland, Jun. 18, 1986, 2461/86

Int. Cl.[4] H05B *3/60*

U.S. Cl. 219—288 **9 Claims**



1. An electrode boiler comprising

a vessel for receiving a supply of water;

at least one electrode in said vessel for heating said water therein;

means for connecting said electrode to an alternating-current power supply;

an electrical insulator of ceramic material mounting said electrode in said vessel; and

a layer of fluoroplastic material on said insulator.

4,812,620

CONCENTRATED RADIANT ENERGY HEAT SOURCE UNIT

Futomi Hayakawa, and Kazuo Onoda, both of Tokyo, Japan, assignors to Hy-Bec Corporation, Tokyo, Japan

Filed May 8, 1986, Ser. No. 860,789

Claims priority, application Japan, May 8, 1985, 60-66863[U]

Int. Cl.[4] H05K *31/00*; H01J *35/00*; B23K *1/04*; H05B *3/00*

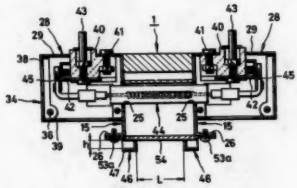
U.S. Cl. 219—347 **2 Claims**

1. A heat source unit for concentrating radiant rays from a heat source lamp onto a processing site of material to be processed, so as to bring this site to a high temperature, comprising

a mirror assembly composed of a pair of symmetrical half bodies, each of which has an arcuate reflecting surface, said bodies together forming a concave mirror;

a pair of reflective end plates mounted detachably on the opposite ends of the mirror assembly;

a pair of masking elements disposed at opposite ends of the mirror assembly, means adjustably interconnecting each masking element with an adjacent said end plate for adjustably supporting the masking elements on the end plates in any of a plurality of positions in which said masking elements are spaced more or less close to each other and overlie a portion of said reflecting surface thereby to define a heat outlet opening of adjustable width;



a heat source lamp supported in front of the mirror and between said end plates; and

means for connecting the heat lamp electrically to an electrical power source to emit radiant heat between said masking elements.

4,812,621

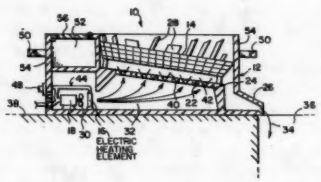
ELECTRICALLY HEATED DISH DRYING RACK

Tania Brotherton, c/o George Spector, 233 Broadway, Rm. 3815, and George Spector, 233 Broadway, Rm. 3815, both of New York, N.Y. 10007

Filed Oct. 28, 1987, Ser. No. 113,496

Int. Cl.[4] F26B *9/10*; H05B *1/00*; F24H *3/04*

U.S. Cl. 219—366 **3 Claims**



1. A dish dryer device which comprises:

(a) a rectangular housing having a bottom, sides and an open top and including a tilted elevated plate in said housing above the bottom thereof having a plurality of slots therein, said housing having a drain spout adjacent and below the lower end of the elevated plate;

(b) a removable rack in which a plurality of dishes can be conveniently stacked, said rack placed upon the elevated plate through said top of said housing;

(c) an electric heating element in said housing below and to high end of the elevated plate and

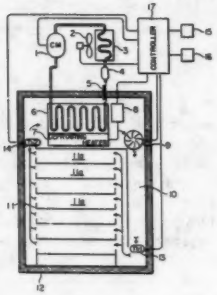
(d) an electric motor with a fan blade in communication with an air inlet in said housing in alignment behind said heating element so as to force air past said heating element to take heat from said heating element, through the slots of the elevated plate drying the dishes within said rack while the drain spout allows excess water dripping from the dishes stacked on said rack and falling through said slots to exit said housing, further comprising a plurality of hot air deflectors, each of which is pivotly mounted within a separate one of the slots in the elevated plate so that the angle of said deflectors can be manually changed to vary the angle of travel of the heated air up to the dishes within said rack.

4,812,622

APPARATUS FOR DEFROSTING FROZEN ARTICLES

Yukimasa Takeda, and Yuji Wakatuki, both of Toyoake, Japan, assignors to Hoshizaki Electric Co., Ltd., Toyoake, Japan

Filed Feb. 11, 1987, Ser. No. 13,421
Claims priority, application Japan, Feb. 19, 1986, 61-32766
Int. Cl.[4] H05B *1/02*; F25B *29/00*
U.S. Cl. 219—400 2 Claims



1. A defrosting apparatus including a housing defining a space for accommodating therein articles to be defrosted, a heat generating means for heating the air within said housing, and an air circulation fan for circulating the air heated by said heat generating means so that the heated air flows through said accommodating space, said apparatus further comprising:

a first temperature detecting means disposed on the air outlet side of said heat generating means for sensing the temperature of the outlet air flowing out from said heat generating means to produce a first detection signal;

a second temperature detecting means disposed on the air inlet side of said neat generating means for detecting the temperature of the air flowing into said heat generating means to produce a second detection signal; and

a controller coupled to said first and second detection means for receiving said first and second detection signals, respectively, and for controlling the defrosting operation of said defrosting apparatus, said controller including a means for comparing the temperature represented by said second detection signal with a defrosting start temperature to energize said heat generating means when the former is lower than the latter, a means for comparing said first detection signal with a reference signal to selectively deenergize or energize said heating generating means on the basis of said reference signal, and a means for comparing the temperature represented by said second detection signal with a defrosting complete signal to stop said defrosting operation when the former is higher than the latter;

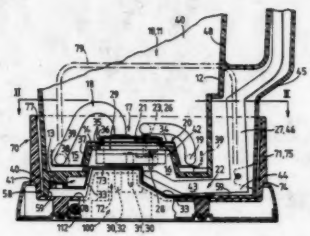
wherein said reference signal has a saw-tooth wave having an upper limit level and a lower limit level, and wherein the difference between said upper and lower limit levels corresponds to a temperature difference of about 1° C., and wherein said heat generating means is deenergized when said first detection signal is of a magnitude greater than said lower limit level of said saw-tooth wave, whereby the temperature of the outlet air from said heat generating mean is maintained substantially constant minimizing the effect of outlet an temperature fluctuations of the termination of defrosting operation.

4,812,623

ELECTRICAL APPARATUS

John D. Haden, Rugeley, and Eric Duxbury, Walsall, both of England, assignors to D. H. Haden Limited, Walsall, England

Continuation-in-part of Ser. No. 819,148, Jan. 15, 1986, Pat. No. 4,707,042. This application Jul. 22, 1987, Ser. No. 76,332
Claims priority, application United Kingdom, Feb. 5, 1985, 8502909; Aug. 3, 1985, 8519552; Jul. 24, 1986, 8618132
Int. Cl.[4] F27D *11/00*
U.S. Cl. 219—437 28 Claims



1. An electrical apparatus having electrical components centralized in a lower part of the apparatus for a lower center of gravity to improve stability as well as for protection against spilling of contents and concealment by a base skirt to assure attractive appearance, electrical safety and convenient operation for water boiling, for processing of a liquid, solid as well as a mixture thereof by heating, mixing or grinding, primarily concerning water boiling in an arrangement which physically incorporates a mechanism responsive to production of steam using substantially identical parts and manufacturing procedures with the only difference being with respect to cordless and cord-attached configurations comprising:

a vessel having a lower portion, an interior that is bounded by a bottom in said lower portion and a wall which extends upwardly from said bottom, and an actuation space that is disposed externally of said interior and extends upwardly at least partially along said wall, and inwardly to below said bottom;

an electrical device disposed in said lower portion and supported by said bottom, said electrical device being connectable to a supply of electricity; and

control means for controlling said electrical device, said control means including: electrical switch means that communicates with said actuation space and is actuable from below said bottom for controlling communication of said electrical device with said supply of electricity; and a non-electrical, manually actuable mechanism that includes a part that is exposed for manual displacement, and extends downwardly in said actuation space from said part and inwardly in said actuation space to below said bottom for actuation of said electrial switch means.

4,812,624

TEMPERATURE SENSOR ASSEMBLY FOR AN AUTOMATIC SURFACE UNIT

Jeffrey A. Kern, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 28, 1987, Ser. No. 138,583
Int. Cl.[4] H05B *3/70*
U.S. Cl. 219—450 15 Claims

1. A temperature sensor assembly for mounting in a central aperture of an automatic solid disk surface unit in a cooking appliance, said assembly comprising:

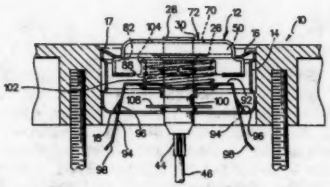
a temperature sensor for sensing temperature of a bottom surface of a utensil being heated on the surface unit;

a metallic hermetically sealed generally cylindrical housing for enclosing said sensor, said housing having base and a

flat upper surface for contact with the bottom of the utensil and an outwardly extending peripheral flange at the base of said housing;

a cylindrical metallic stem extending downwardly from said base;

upper and lower centrally apertured insulating members to thermally isolate said housing from the surrounding surface unit, said housing projecting upwardly through the aperture in said upper insulating member for contact with



the utensil being heated and said stem projecting downwardly through the aperture in said lower insulating member, said peripheral flange being sandwiched between said upper and lower insulating members to retain said housing;

a metallic skirt conforming to and outer contour of said upper and lower insulating members, said skirt having an upper edge which extends inwardly over a portion of said upper insulating member toward said housing but spaced therefrom defining a gap therebetween.

4,812,625

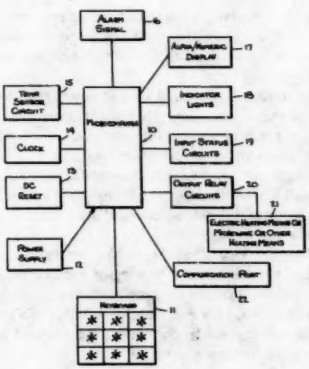
TEMPERATURE CONTROL SYSTEM FOR COOKING APPARATUS

Mario G. Ceste, Sr., Stratford, Conn., assignor to Food Automation-Service Techniques, Inc., Stratford, Conn.

Filed Sep. 30, 1987, Ser. No. 103,448

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—497 **13 Claims**



1. A temperature control system for cooking apparatus having a cooking mode and a second mode of operation comprising:

first means for heating a cooking medium;

second means for sensing the actual temperature of the cooking medium;

third means for determining whether the cooking apparatus is in a cooking mode or a second non-cooking mode of operation; and

fourth means responsive to said mode-determining means and to said sensing means for using on/off control during at least a portion of the cooking mode if the cooking apparatus is in the cooking mode and for using proportional band control if the cooking apparatus is in a second non-cooking mode, said heating means being responsive to said fourth means.

4,812,626

THERMOSTATICALLY CONTROLLED ELECTRIC IMMERSION HEATER FOR AQUARIUMS

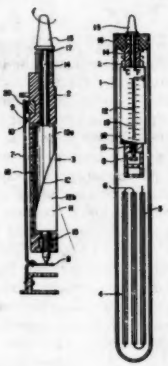
Antonio Strada, Via Interna, 44/e, 33170 Pordenone, Italy

Filed Nov. 5, 1986, Ser. No. 927,168

Claims priority, application Italy, Nov. 8, 1985, 61949/85[U]

Int. Cl.[4] H05B *1/02, 3/78;* H01H *37/52*

U.S. Cl. 219—523 **9 Claims**



1. In an immersion heater for an aquarium including, within a vertically disposed waterproof elongated transparent tubular envelope, an electric heating element in the lower portion of said envelope and an adjustable temperature regulating unit in the upper portion of said envelope controlling operation of the heating element, the temperature regulating unit including both a bimetal strip responsive to the temperature of said envelope and axially movable adjustment means operable from the exterior of said envelope for varying the rest position of said bimetal strip and thus the operating temperature of the device, the improvement wherein said adjustment means includes in combination

a threaded pin (13) having an end resting against the bimetal strip (7) and rotatable by means extending through the upper end of said envelope to the exterior thereof,

a cylindrical body (11) rotatable with said threaded pin and provided on its outer surface with a helical line (12) running over the entire length of said outer surface and dividing it into portions,

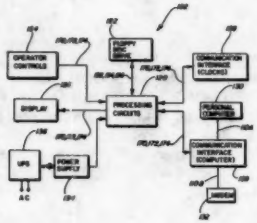
a screen (18) within said envelope adjacent said cylindrical body and visible from the exterior of said envelope, said screen having a vertically disposed longitudinal slot (19) through which a short portion of said helical line (12) is visible,

at least one graduated scale alongside said slot indicating temperature values which, for each angular position of said regulating unit (3) and, therefore, for each axial position of its end in contact with the bimetal strip (7), correspond to an operating temperature of the device as indicated on said scale by that portion of the helical line (12) visible through the slot (19).

4,812,627
TIME CLOCK SYSTEM

Joel S. Wexler, Des Plaines, and John J. Bednarz, Elmhurst, both of Ill., assignors to Cyborg Systems, Inc., Chicago, Ill.

Filed Mar. 28, 1986, Ser. No. 845,542
Int. Cl.[4] G06K 7/10
U.S. Cl. 235—377 7 Claims



1. An attendance recording system comprising:

a plurality of satellite devices, each adapted to register information concerning the respective arrival and departure times of a plurality of individuals, and having means for storing said information temporarily;

at least one central device having storage means capable of writing to and reading from a non-volatile storage medium adapted to permanently store said information for a substantial plurality of said individuals, processing means, data communication means responsive to said processing means, first communications channel means linking said communications means to said satellite devices, and program means arranged to direct said processing means to cause said data communications means to periodically read out of said temporary storage means of said satellite devices and transmit over said communications channel means and write to said non-voltile storage medium of said storage means of said central device information relating to said substantial plurality of individuals;

and means for communicating the information stored by said non-volatile storage medium to a general purpose programmable computer;

said means for communicating with said general purpose programmable computer including additional communications channel means capable of connection to said general purpose programmable computer;

said program means being arranged to direct said processing means to cause said data communications means to read out said information from said non-volatile storage means and transmit it over said additional communications channel means.

2. In a system of the type adapted to record arrival and departure times of employees;

said system being designed for use with a plurality of machine-readable identification documents adapted to be given to respective employees and at least one supervisor, said documents containing information for identifying the recipients thereof;

the identification document of any such supervisor containing information which distinguishes a supervisor from non supervisors;

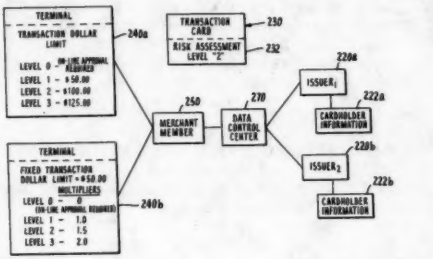
said system having at least one time clock station including document reading means adapted to read said identification documents, alterable storage means for storing information read from said identification documents, user-operated means for altering the currently stored information, processing means, and program means for directing said processing means;

the improvement wherein said program means is arranged to cause said processing means to prevent said user-operated altering means from altering at least one reserved field comprising less than all of the information read from said identification documents and stored in said alterable storage means, but to permit said reserved field to be altered thereby when said supervisor identifying information is detected.

4,812,628
TRANSACTION SYSTEM WITH OFF-LINE RISK ASSESSMENT

Vincent Boston, San Mateo; Elvis W. Boggan, Concord, and Einar L. Asbo, Mill Valley, all of Calif., assignors to Visa International Service Association, San Mateo, Calif.

Continuation-in-part of Ser. No. 730,309, May 2, 1985, Pat. No. 4,734,564. This application Mar. 27, 1987, Ser. No. 31,390
The portion of the term of this patent subsequent to Mar. 29, 2005, has been disclaimed.
Int. Cl.[4] G06K 5/00
U.S. Cl. 235—380 8 Claims



1. A system wherein an issuer of transaction cards can regulate the type of authorization requests associated with a transaction that are transmitted from the point of transaction, said system comprising:

processor means maintained at a location remote from the point of transaction, said processor means including a file means containing cardholder information, supplied by the issuer, for evaluating a transaction;

a transaction card carrying data identifying the cardholder, said card further including data, supplied by the issuer and representative of risk assessment information associated with the cardholder; and

terminal means located at the point of transaction and connectable to said remote processor means, said terminal means having a means for reading the data carried on said card and a means for entering the amount of a transaction, said terminal means further including a means for storing information representative of a plurality of transaction limits, said terminal means further including a local processor means for evaluating a transaction based on the transaction amount and the risk assessment information carried on said card, and wherein said risk, assessment information on the card is used to select a transaction limit for the pending transaction, with said terminal means functioning to generate an approval code if the transaction amount does not exceed the pending transaction limit and if the amount does exceed that limit, said terminal means will connect to said remote processor means and forward the transaction information to said remote processor means for evaluation.

4,812,629

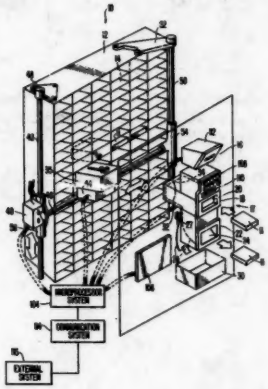
METHOD AND APPARATUS FOR VENDING

James P. O'Neil, and Ken R. Powell, both of San Diego, Calif., assignors to Term-Tronics, Incorporated, San Diego, Calif.

Continuation of Ser. No. 708,897, Mar. 6, 1985, abandoned. This application Apr. 23, 1987, Ser. No. 42,594

Int. Cl.[4] G06K *15/00*

U.S. Cl. 235—383 13 Claims



1. A dispensing machine for holding a plurality of separate items in storage positions and selectively dispensing or receiving the items, the dispensing machine comprising:

a plurality of storage positions which are not user-accessible;

at least one vend position which includes a user-accessible opening;

memory means for storing and processing information about the contents of the storage positions and the identity and location of the stored items;

means for accepting user input for selecting or returning an item;

carrier means for selectively transferring a selected item between one of said storage positions and said vend position in response to user input, said carrier means including a rotatable table and means for moving said table to a first position proximate a selected storage position and a second position proximate said vend position;

engaging means slidably connected to said table for selectively engaging and releasing a selected item when said rotatable table is in either of said first and second positions, said engaging means comprising a mechanical finger means;

rotating means for rotating said table so that said engaging means is aligned with a selected storage position or a vend position when said rotatable table is in either of said first and second positions;

means for sliding said engaging means from a home position to an extended position in which the engaging means extends toward a selected storage position or vend position to engage or release a selected item in one of said storage or vend positions;

control means coupled with and combining with said memory means, carrier means, engaging means, rotating means and sliding means for (1) transferring an item from a storage position to a user-accessible opening in response to a user selection and (2) transferring a returned item from a user accessible opening to an empty storage position upon return of the item; and

reader means coupled with said memory means for identifying an item which is dispensed or returned through the user-accessible opening.

4,812,630

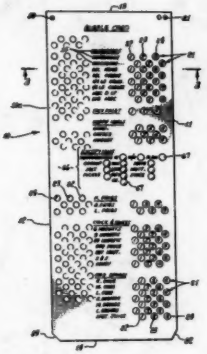
MANUALLY ACTUABLE, MACHINE, READABLE MENU CARD

Harbers, Jr., H. C., Templeton, Calif., assignor to Escorp, Inc., San Luis Obispo, Calif.

Continuation-in-part of Ser. No. 916,942, Oct. 8, 1986. This application Jan. 28, 1988, Ser. No. 149,492

Int. Cl.[4] G06K *7/04*

U.S. Cl. 235—448 24 Claims



1. A menu device, comprising

(a) a card having a transparent section,

(b) indicia on the card listing items to be selected,

(c) bubbles on the card transparent section and generally in alignment with said indicia, the bubbles having positions on the card representative of items to be selected,

(d) each bubble having a first position projecting in one direction outwardly from the plane of the card, and a second position into which it is displaced relative to the plane of the card, by finger pressure, to indicate selection of items corresponding to bubble position on the card.

4,812,631

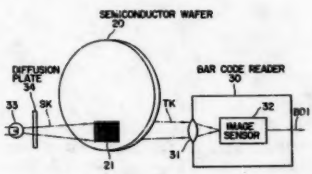
BAR CODE AND READ-OUT METHOD THEREOF

Keiji Hiramatsu, Tokyo, Japan, assignor to Kam Kwong Lee Limited, Hong Kong

Filed Jun. 2, 1987, Ser. No. 56,999

Int. Cl.[4] G06K *7/10*

U.S. Cl. 235—467 10 Claims



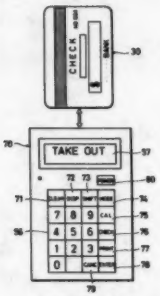
1. A bar code characterized in that said bar code in formed of a member for reflecting or absorbing infrared rays on a semiconductor wafer which is penetrated with said infrared rays.

4,812,632

PORTABLE MAGNETIC CARD READING AND WRITING APPARATUS WITH VERIFICATION OF CONSTANT AND USER SUPPLIED DATA

Koichiro Kakinuma; Makoto Ando, both of Tokyo; Masahiko Sawa, Kanagawa; Hideaki Ohmuro, Chiba; Akira Ohryo, Tokyo, and Tadahiko Nakamura, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 11, 1986, Ser. No. 850,673
Claims priority, application Japan, Apr. 15, 1985, 60-80027
Int. Cl.[4] G06K 5/00, 7/08
U.S. Cl. 235—479 11 Claims



1. A portable card writer for writing user supplied data on a card with a magnetic stripe provided thereon adapted to store constant data and user supplied data comprising:

a chassis;

driving means mounted on said chassis for moving said card forwardly and backwardly relative to the chassis;

means for guiding said card along said chassis;

a single magnetic writing head mounted on said chassis aligned with said magnetic stripe for writing during backward movement of said card user supplied data on said card;

a single magnetic reading head mounted on said chassis adjacent to said magnetic writing head and aligned with said magnetic stripe for verifying, during forward motion of said card, constant data recorded on said card and for verifying said user supplied data written by said writing head during backward movement of said card, as said user supplied data is written by said writing head; and

printer means for writing said user supplied data on said card at a portion other than said magnetic strip.

4,812,633

OPTICAL DATA CARD

Peter J. Vogelgesang; John W. Ulseth, both of Roseville; Norman L. Giorgini, W. St. Paul, and Jathan D. Edwards, Oakdale, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 8, 1988, Ser. No. 179,318
Int. Cl.[4] G06K 19/00
U.S. Cl. 235—487 13 Claims

1. A data card comprising:

a substrate having a magneto-optic active region configured for rotational recording of data; and

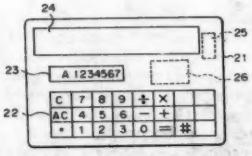
first fender means for protecting the magneto-optic recording region disposed adjacent an outer circumference of the recording region.

4,812,634

IC CARD WITH A SOLAR BATTERY

Satoshi Ohta; Kouzi Tanagawa, both of Tokyo; Hideo Yamamoto, and Keiji Kumagai, both of Saitama, all of Japan, assignors to Oki Electric Industry Co., Ltd. and Toa Nenryo Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Jul. 12, 1988, Ser. No. 218,082
Claims priority, application Japan, Jul. 13, 1987, 62-174544
Int. Cl.[4] G06K 19/06
U.S. Cl. 235—492 7 Claims



1. An IC card with a solar battery comprising; a card body, a key input portion for data input mounted on a first surface of said card body, a display unit for data display mounted on said first surface of said card body, a solar battery for supplying operational power for said IC card mounted on said first surface of the card body, and an integrated circuit having at least a CPU, a ROM for storing program for operating said CPU, a RAM for storing operational data of said CPU, and an EEPROM for storing electrically erasable read only data, wherein the improvements comprise in that;

said solar battery is a tandem type solar battery having a substrate, a plurality of laminated opto-electric conversion cells made of amorphous silicon deposited on said substrate, and a transparent electrode deposited on said conversion cells,

each conversion cell is comprised of P-layer, I-layer and N-layer, and said N-layer is made of micro-crystal silicon, and said P-layer and said I-layer are made of amorphous silicon and thickness of said N-layer is in the range between 80 Å and 110 Å.

4,812,635

OPTOELECTRONIC DISPLACEMENT SENSOR WITH CORRECTION FILTER

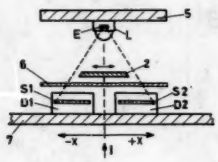
Meinolph Kaufmann, Baden; Karl Klöti, Fislisbach; Jürgen Nehring, Wettingen, and Hanspeter Schad, Rieden, Switzerland, assignors to BBC Brown Boveri AG, Baden, Switzerland

Filed Aug. 27, 1987, Ser. No. 90,897

Claims priority, application Switzerland, Sep. 5, 1986, 3578/86

Int. Cl.[4] G01D 5/34

U.S. Cl. 250—231 R 11 Claims



1. An optoelectronic displacement sensor for the absolute measurement of displacement in the submicrometer range, in particular for the positioning of optical waveguides, comprising:

at least one light source having a certain intensity distribution;

at least two flat, thermally coupled, optoelectronic radiation sensors disposed beside one another opposite said light source, each of said radiation sensors being at least partially illuminated by said light source and delivering an output signal in dependence of said illumination;

an electronic measuring circuit connected to said radiation sensors and forming the difference of said output signals of said two radiation sensors;

a diaphragm disposed between said light source and said radiation sensors, said diaphragm being displaceable parallel to said radiation sensors and being operable so that, in the case of a displacement of said diaphragm in one direction, the illuminated area of one of said radiation sensors is increased, while the illuminated area of the other of said radiation sensors is correspondingly reduced; and

a correction filter having a transmissive filter area fixedly disposed between said light source and said radiation sensors, wherein the transmission of said correction filter varies over said filter area so that inhomogenities in said intensity distribution of said light source are specifically eliminated.

4,812,636

AUTOMATIC FOCAL POINT CONTROL APPARATUS WITH CORRECTION OF SEQUENTIAL DEFOCUS SIGNALS DEPENDENT ON OBJECT CONTRAST

Yosuke Kusaka, Yokohama, and Ken Utagawa, Kawasaki, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 863,065, May 14, 1986, abandoned. This application Mar. 23, 1988, Ser. No. 173,023

Claims priority, application Japan, May 23, 1985, 60-111144

Int. Cl.[4] G01J 1/20; G03B 13/18

U.S. Cl. 250—201 15 Claims

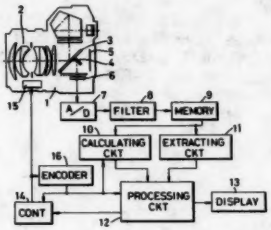
1. An apparatus for causing a focusing optical system to form an object image on a predetermined surface, including:

(a) means for detecting a light intensity distribution of light from an object on the predetermined surface and sequentially producing object image data;

(b) defocus signal producing means responsive to said object image data for time-serially producing defocus signals representing a positional relationship between said predetermined surface and said object image;

(c) contrast detecting means responsive to said object image data for time-serially producing contrast information signals each of which represents a value conforming to a contrast of said object image, the value of each of said contrast information signals decreasing in response to a decrement of the contrast of said object image;

(d) calculating means responsive to said defocus signal producing means and said contrast detecting means for calculating a weighted average of a plurality of said defocus signals by using a corresponding number of said contrast information signals as weighting coefficients with respect



said weighted average and thereafter producing a weighted average defocus signal conforming to the calculated weighted average, each of said plurality of said defocus signals corresponding, respectively, to each of said corresponding number of said contrast information signals; and

(e) driving means for driving said focusing optical system in response to said weighted average defocus signal .

4,812,637

OPTICAL DISC HEAD WITH HIGH SIGNAL-TO-NOISE RATIO

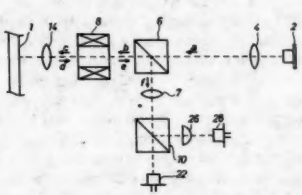
Kazunari Taki, Nagoya-shi, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Jun. 24, 1987, Ser. No. 66,015

Claims priority, application Japan, Jul. 7, 1986, 61-159346; Jul. 7, 1986, 61-159347; Jul. 10, 1986, 61-162431; Jul. 28, 1986, 61-177357

Int. Cl.[4] G11C 13/06

U.S. Cl. 250—201 9 Claims



1. A disc head for an optical disc comprising:

a light source for emitting a beam of light toward an optical disc;

a Faraday rotator, which is disposed between the light source and the optical disc, for rotating a plane of polarization of the light beam emitted from the light source by 45°;

a beam splitter, which is disposed between the Faraday rotator and the light source, for passing a component with a specific plane of polarization of the light beam emitted from the light source, and for reflecting a light beam with a plane of polarization perpendicular to the specific plane of polarization which has again passed the Faraday rotator after being reflected by the optical disc; and

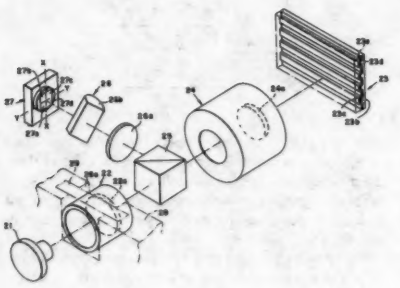
a light sensor for sensing a light beam reflected by the beam splitter.

4,812,638

FOCUSING ERROR DETECTOR AND OPTICAL DATA DETECTING DEVICE INCORPORATING THE FOCUSING ERROR DETECTOR

Nobuo Ogata; Yasuo Nakata; Hideaki Satou, all of Nara; Toshiyuki Tanaka, Osaka; Etsuji Minami; Yoshio Yoshida, both of Nara; Yukio Kurata, Tenri, all of Japan, and Teruaki Inoue, deceased, late of Nara, Japan (by Takayuki Inoue, Kazuko Inoue, heirs), assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 28, 1987, Ser. No. 78,773
Claims priority, application Japan, Jul. 28, 1986, 61-178513; Jan. 23, 1987, 62-13611; Mar. 31, 1987, 62-79241
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 6 Claims



1. A focusing error detector, comprising:
a light source;
a collimator lens for making pencil of rays emitted by said light source parallel;
an objective lens which focuses the parallel pencil of rays to form a beam spot on a data-recording disc, said data-recording disc having data tracks and guide tracks formed on it, said objectives lens receiving the pencil of rays reflected from said data-recording disc;
an optical system for forming a beam spot from the reflected pencil of rays incident from said objective lens; and
an optical detector for receiving said beam spot from said optical system and having a plurality of divided optical sensor blocks for sensing said beam spot formed on said optical detector, said optical detector detecting a focusing error of said beam spot formed on said data-recording disc according to a configuration of the received beam spot;
said objective lens or said collimator lens being placed at rotation positions to minimize an influence of an aberration in said optical system between said light source and said data-recording disc on a diffraction pattern's symmetry with respect to an axis corresponding to a direction at a right angle to said guide tracks, said diffraction pattern being formed with said beam spot on said optical detector.

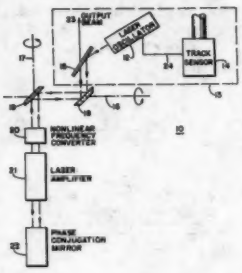
4,812,639

SELF-ALIGNING PHASE CONJUGATE LASER

Robert W. Byren, Hermosa Beach, and David A. Rockwell, Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 19, 1985, Ser. No. 810,808
Int. Cl.[4] G02F *1/00*
U.S. Cl. 250—203 R 20 Claims

1. Apparatus for automatically aligning a beam of radiation with a pointing device comprising:
a radiation emission means which is mechanically, fixedly coupled to said pointing device, such that substantially all rotation and translation of said pointing device is simultaneously and synchronously experienced by said radiation emission means;
nonlinear phase conjugate reflecting means which is mechanically decoupled from said pointing device; and
radiation coupling means disposed between said emission



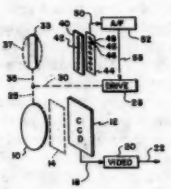
means and said phase conjugate reflecting means for conveying emitted radiation from said emission means to said phase conjugate reflecting means such that any aberration induced into said emitted beam by a motion of said pointing device is substantially compensated for by said phase conjugate reflecting means.

4,812,640

SLIT LENS AUTOFOCUS SYSTEM

Dennis J. Wilwerding, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 28, 1987, Ser. No. 54,986
Int. Cl.[4] G01J *1/36*
U.S. Cl. 250—204 9 Claims



1. Apparatus for use with an autofocus camera comprising:
a taking lens;
motive means for moving the taking lens to a position where the image of a remote object is in proper focus;
a pair of radiation detectors;
auxiliary lens means connected to the motive means to be movable with the taking lens; and
means positioned between the detectors and the auxiliary lens means to produce an image of the exit pupil of the auxiliary lens means on the detectors, the auxiliary lens means being so configured that the image of the exit pupil there of is an elongated band.

4,812,641

HIGH POWER OPTICAL FIBER FAILURE DETECTION SYSTEM

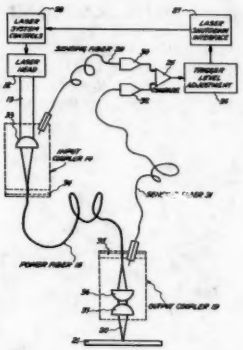
Angel L. Ortiz Jr., Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 3, 1987, Ser. No. 10,503
Int. Cl.[4] G01J *1/32*
U.S. Cl. 250—205 5 Claims

1. A laser beam delivery system comprising a laser having a wavelength of 1.06 micrometers or less which generates a high

power laser beam, a single clad quartz optical fiber, an input coupler to shape said beam and inject laser energy into one end of said optical fiber, an output coupler to collect laser energy emerging from the other end of said optical fiber and focus said beam at a power density sufficient to perform industrial material processing, and an improved fiber break and leak detection system comprised of:

means for monitoring injection laser power and power out of



said optical fiber including first and second photo detectors to respectively sense light intensities inside said input and output couplers;

means for comparing injection and output laser power levels and detecting a decrease in the latter that exceeds a set threshold and indicates the beginning of a break or leak in said optical fiber; and

means for triggering a laser system shutdown upon detection of such a decrease in the laser output power level.

4,812,642

OPTICAL COORDINATE SYSTEM INPUT DEVICE

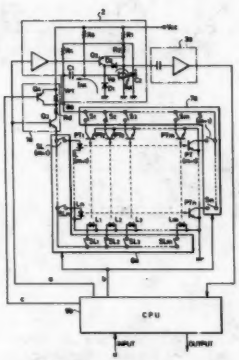
Kazuo Hasegawa; Junichi Ohuchi, and Hiroaki Sasaki, all of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Jan. 29, 1987, Ser. No. 8,625

Claims priority, application Japan, Apr. 24, 1986, 61-95667; Jun. 30, 1986, 61-153174; Jun. 30, 1986, 61-153175; Jun. 30, 1986, 61-153176

Int. Cl.[4] G01V 9/04

U.S. Cl. 250—221 **10 Claims**



6. In an optical coordinate system input device including a plurality of light emitting elements, a plurality of light receptor elements each paired opposite a corresponding one of said light emitting elements, a drive circuit for supplying said light emitting elements with a drive current, a switching circuit for sequentially connecting said drive circuit to each of said light emitting elements in turn so as to drive them to emit respective light signals to the corresponding ones of said light receptor elements, and coordinate detecting means for detecting a respective output terminal voltage of each one of said light receptor elements and, when any one of said light receptor elements does not receive a light signal emitted from the corresponding one of said light emitting elements, for generating a coordinate position signal in response thereto,

the improvement comprising:

a current limiting means for limiting said drive current to a reduced inspection value during an inspection mode;

a drive current switching means for switching said drive current to a normal value during a normal operation mode, and to said inspection value of said current limiting means during said inspection mode; and

means for discriminating during said inspection mode when a light receptor element is deteriorated based upon the output terminal voltage of the light receptor element when said drive current switching means applies said drive current of the reduced inspection value thereto.

4,812,643

DETECTOR DEVICE FOR A BLADE TRACKING SYSTEM HAVING TWO SENSORS

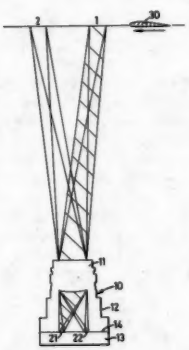
Richard Talbot, Romsey, United Kingdom, assignor to Stewart Hughes Limited, Hampshire, United Kingdom

Continuation of Ser. No. 861,922, May 12, 1986, abandoned. This application Mar. 16, 1988, Ser. No. 170,633

Claims priority, application United Kingdom, May 16, 1985, 8512443

Int. Cl.[4] G01V 9/04

U.S. Cl. 250—222.1 **14 Claims**



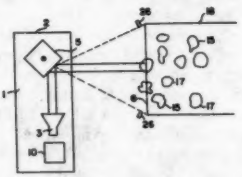
1. A detector for a blade tracking system, said detector comprising: a housing; a single lens supported in said housing for focusing in a plane a bundle of radiation passing therethrough; at least two radiation sensors being fixed within said plane and having optical axes inclined at a known angle, each sensor receiving radiation focussed by said lens and being located within said housing so that a blade passing through and interfering with said radiation bundle is sensed separately and sequentially by each of said sensors; and means for comparing the difference in timing between independent signals generated by each of said sensors in response to interference of radiation sensed by each of said sensors to calculate by triangulation a track of the blade regardless of relative positioning between the blade and the optical axis of each sensor.

4,812,644

METHOD AND A DEVICE FOR ASSORTMENT OF A PRODUCT FLOW

Bertil Larsson, Höör; Erik T. Andersson, Lund, and Rolf G. R. H ahansson, Höör, all of Sweden, assignors to AGEC AB, Hoor, Sweden

Filed May 20, 1987, Ser. No. 52,758
Claims priority, application Sweden, May 21, 1986, 8602298-5
Int. Cl.[4] G01N *9/04*; G01J *3/50*
U.S. Cl. 250—223 R 6 Claims



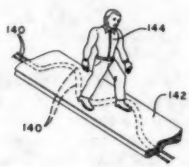
1. A device for assorting objects comprising:
a light source for emitting a light beam;
a rotary mirror connected to a means for rotating said mirror, said mirror comprising a surface having a first part for directing light towards objects in free fall and a second part on the same side of the mirror as the first part for receiving light reflected from the objects, said rotary mirror capable of rotating to direct the reflected light over a scanning range containing said objects in free fall;
an optical unit for refracting light reflected from said surface of said mirror; and
a detection means for receiving light retracted by said optical unit, said detection means comprising at least one detector unit, a means for converting wavelengths of light to at least one electric signal, and a means for determining whether an object is a desired object or undesired object based on said at least one electric signal.

4,812,645

STRUCTURAL MONITORING SYSTEM USING FIBER OPTICS

Richard W. Griffiths, Pacific Palisades, Calif., assignor to G2 Systems Corporation, Pacific Palisades, Calif.

Continuation-in-part of Ser. No. 712,889, Mar. 18, 1985, Pat. No. 4,564,520, Continuation-in-part of Ser. No. 571,364, Jan. 16, 1984, abandoned, which is a continuation of Ser. No. 295,600, Aug. 24, 1981, abandoned. This application Mar. 27, 1987, Ser. No. 32,042
The portion of the term of this patent subsequent to Mar. 31, 2004, has been disclaimed.
Int. Cl.[4] G01L *1/24*
U.S. Cl. 250—227 4 Claims



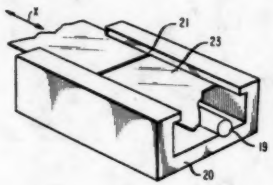
3. A method of monitoring a physical movement occurring at any point between spaced points on a structure, including the steps of:
coupling with coupling means at least one optical fiber continuously to said structure to extend from at least one of the spaced points to the other and thereby engage all points along the structure between said points so that physical movement of the structure between said spaced points will result in physical movement of the optical fiber;
passing a first light signal into said optical fiber; and
detecting attenuations in said first light signal resulting from said physical movement to thereby provide an indication that a physical movement has taken place.

4,812,646

OPTICAL FIBER INITIALIZATION METHOD AND APPARATUS

Paul Waszkiewicz, Agoura Hills, Calif., assignor to Photon Devices, Ltd., Newport Beach, Calif.

Filed Nov. 3, 1987, Ser. No. 116,554
Int. Cl.[4] G02B *6/06*; H01J *5/16*
U.S. Cl. 250—227 9 Claims



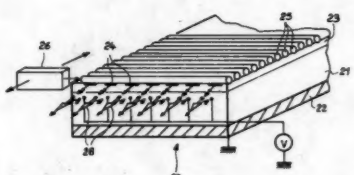
1. An initializing method for determining the associated positions of ends of a bundle of conduits of electromagnetic radiation in an exit field with respect to light entering the entrance field of the bundle, said method comprising the steps of moving incrementally a beam of light having a dimension small compared to the size of one of said conduits, coupling said exit field to a sensor array having an array of discrete sensors, interrogating said array for each incremental movement of said beam along said path, storing the address of each sensor newly activated during each interrogation, and storing the address of each newly activated sensor which becomes deactivated when the beam is moved to a consecutive position along said path.

4,812,647

OPTICAL ADDRESSING DEVICE AND ITS USE IN ELECTRO-OPTICAL IMAGING DEVICES

Dominique Broussoux, Marcoussis; Francois Micheron, Gif sur Yvette; Alain Staron, Paris, and Jacques Trotel, Palaiseau, all of France, assignors to Thomson-CSF, Paris, France

Filed Jul. 7, 1987, Ser. No. 70,703
Claims priority, application France, Jul. 7, 1986, 86 09834
Int. Cl.[4] H01J *5/16*
U.S. Cl. 250—227 12 Claims



1. An optical addressing device for the optical identification of zones on a surface of a photoconductor imaging device, comprising one or more lateral parallel diffusion light guides arranged in a flat array in a direction parallel to the surface and diffusing light on the whole length of each guide, coupled by one end to a light source and to control means so as to selec-

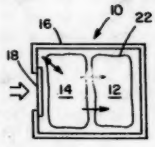
tively illuminate each zone of the surface by means of at least one light guide, and reading means for successively producing signals corresponding to each zone addressed by said one or more lateral diffusion light guides.

4,812,648

METHOD OF AND PASSIVE APPARATUS FOR DETECTING RADON

Daniel Perlman, Arlington, Mass., assignor to Brandeis University, Waltham, Mass.

Filed Mar. 31, 1987, Ser. No. 32,745
Int. Cl.[4] G01V 5/00
U.S. Cl. 250—255 **11 Claims**



1. In a passive diffusion device for measuring the radioactive radon concentration in ambient air having an adsorbent of radon in a container with one or more diffusion openings, the improvement comprising:

juxtapositioning the adsorbent with a desiccant,

the desiccant being present in a sufficient quantity to keep the adsorbent substantially moisture-free for between 1 day and 1 week during exposure to radon under relative humidity conditions ranging from 0 to 100%,

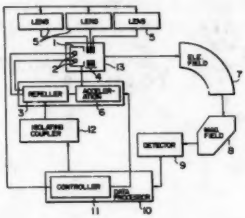
the juxtaposed desiccant being placed in close proximity with the adsorbent so that the ambient air, carrying radioactive radon, can enter the adsorbent and the weight of desiccant is sufficient to remove moisture out of the adsorbent during the period of exposure of the device to the ambient air.

4,812,649

CONTROL IN MASS ANALYZER

Katsuhiro Nakagawa, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 7, 1987, Ser. No. 105,251
Claims priority, application Japan, Oct. 8, 1986, 61-239944
Int. Cl.[4] B01D 59/44
U.S. Cl. 250—296 **5 Claims**



1. A mass analyzer comprising:

an ionization chamber for generating ions;

repeller means including a repeller voltage source for repelling the generated ions by a repeller voltage produced by said repeller voltage source;

acceleration means including an acceleration voltage source for accelerating the generated ions by an acceleration voltage produced by said acceleration voltage source;

lens means including a lens voltage source for controlling the generated ions by a lens voltage applied from said lens voltage source;

field means for providing an electric field and a magnetic field for cooperatively converging incident ions;

detector means for detecting the converged ions;

data processor means for effecting a qualitative analysis or a quantitative analysis of a sample based on a quantity of the detected ions;

controller means for controlling output voltages from said repeller voltage source, said acceleration voltage source, and said lens voltage source, said output voltages each being a floating voltage due to a high-voltage acceleration voltage from said acceleration voltage source; and

an insulating section means for electrically insulating said repeller voltage source from said controller means; wherein

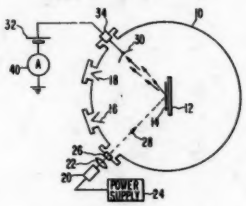
said data processor means sets the output voltage of said repeller voltage source via said controller means and said insulating section means such that the ion quantity develops a maximum value depending on the ion quantity thus detected.

4,812,650

GROWTH RATE MONITOR FOR MOLECULAR BEAM EPITAXY

James N. Eckstein, Cupertino; Christopher Webb, Los Altos, and Shang-Lin Weng, Cupertino, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 94,247, Sep. 8, 1987, abandoned. This application Jul. 15, 1988, Ser. No. 223,747
Int. Cl.[4] G01N 21/00
U.S. Cl. 250—307 **24 Claims**



1. A method of measurement of the growth rate of a film being grown on a substrate in a molecular beam epitaxy apparatus, the method comprising the steps of:

(a) illuminating the growing film with light of energy sufficient to cause photoemission of electrons,

(b) collecting the photoemitted electrons on a collector,

(c) detecting the photoemitted electron current to said collector as a function of time, and

(d) analyzing oscillations of the photoemitted electron current to the collector to count molecular layers grown as a function of time.

4,812,651
SPECTROMETER OBJECTIVE FOR PARTICLE BEAM MEASURING INSTRUMENTS

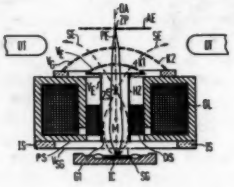
Hans-Peter Feuerbaum, Munich, and Juergen Frosien, Ottobrunn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 13, 1987, Ser. No. 120,133

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1986, 3638682

Int. Cl.[4] H01J *37/26*

U.S. Cl. 250—310 18 Claims



1. An improved spectrometer objective for use in a particle beam measuring instrument having a particle beam directed onto a specimen and an electrode arrangement for generating an retarding electrical field, the improvement comprising:

an extraction grid electrode at a first predetermined potential for extracting and accelerating secondary particles generated at the specimen by the particle beam toward the retarding electrical field; and

a planar electrode disposed between said extraction grid electrode and the speciment and having a second predetermined potential, said second predetermined potential being less than said first predetermined potential and not less than the potential of the specimen to provide a uniform electrical field between said planar electrode and said extraction electrode.

4,812,652
IMAGING METHOD AND APPARATUS FOR ELECTRON MICROSCOPES

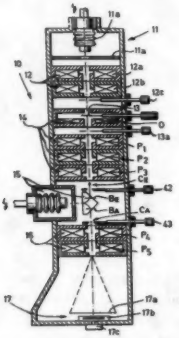
Wilhelm Egle, Aalen, Fed. Rep. of Germany; F. Peter Ottensmeyer, Don Mills, Canada, and Albrecht Rilk, Königsbronn, Fed. Rep. of Germany, assignors to Carl-Zeiss Stiftung, Heidenheim, Fed. Rep. of Germany

Continuation of Ser. No. 743,479, Jun. 11, 1985. This application Apr. 17, 1987, Ser. No. 40,533

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1984, 3423149

Int. Cl.[4] H01J *37/26*

U.S. Cl. 250—311 30 Claims



1. A transmission electron microscope capable of producing enlarged images throughout a high magnification range and a medium magnification range, said microscope comprising:

(a) means for holding an object to be examined in a predetermined fixed object plate;

(b) a source of electrons providing a beam for illuminating said object;

(c) an imaging electron-energy spectrometer having a predetermined fixed input image plane and a predetermined fixed input crossover point as well as a predetermined fixed output image plane;

(d) first imaging means including at least four electron-optical lens groups for producing an image of said object at said input image plane of said spectrometer and producing an image of said source of electrons at said input crossover point of said spectrometer;

(e) said first imaging means having a first lens group producing a first real intermediate image of said object and a first real intermediate image of said source;

(f) said first imaging means having a second lens group imaging said first intermediate image of said object to form a second intermediate image of said object which is real during operation in said high magnification range and which is virtual during operation in said medium magnification range; and imaging said first intermediate image of said source to form a second real intermediate image of said source;

(g) said first imaging means having a third lens group imaging said second intermediate image of said object to form a third real intermediate image of said object and imaging said second intermediate image of said source to form a third intermediate image of said source which is real during operation in said high magnification range and which is virtual during operation in said medium magnification range;

(h) said first imaging means further having a fourth lens group imaging said third intermediate image of said object to form a fourth real intermediate image of said object at said input image plane of said spectrometer and imaging said third intermediate image of said source to form a fourth real intermediate image of said source at said input crossover point of said spectrometer;

(i) current supply means connected to respective ones of said lens groups for adjusting the current supplied thereto so as to cause said first imaging means to always image said source into said input crossover point and to always image said object into said input image plane irrespective of changes in magnification within said range thereby avoiding manual refocusing of said first imaging means; and,

(j) second imaging means arranged downstream of said spectrometer for imaging an image of said object in said output image plane of said specrometer into a final image plane.

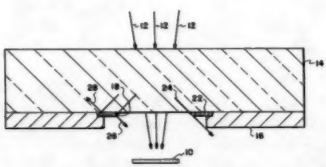
4,812,653
SHARP EDGE FOR THICK COATINGS

David M. Comey, Concord, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 1, 1987, Ser. No. 127,078

Int. Cl.[4] G01J *5/06*

U.S. Cl. 250—338.1 13 Claims



1. Radiation responsive apparatus which includes an infrared radiation detector and a layer of infrared radiation absorbing

material having an opening for radiation to pass therethrough to the detector, the opening extending from a first surface of the material through a first thickness thereof and exiting from a second surface comprising:

a layer of infrared radiation blocking material adjacent the first surface and positioned around the opening to form an aperture having edges of a second thickness less than the first thickness to minimize reflection of radiation from the edges.

4,812,654

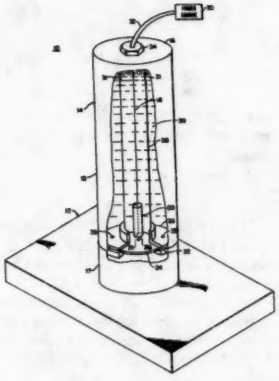
TWO-AXIS QUARTZ FIBER PASSIVE TILT METER

Richard K. Araujo, Tewksbury, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Dec. 29, 1986, Ser. No. 946,885

Int. Cl.[4] G01C 9/06

U.S. Cl. 250—338.1 **14 Claims**



1. A two-axis quartz fiber passive tilt meter comprising:

a housing;

a quartz fiber suspended from said housing for conducting radiation and emitting said radiation from a distal end thereof;

a pendulous mass suspended from said quartz fiber;

a damping fluid in said housing surrounding said quartz fiber and said mass, said damping fluid having an index of refraction close to that of said quartz fiber for optically cladding said fiber; and

detector means for sensing the position of a spot of radiation emitted from said quartz fiber.

4,812,655

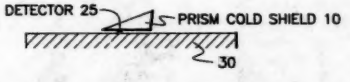
PRISM COLD SHIELD

David L. Jungkman, Hudson; James W. Howard, Natick, and Timothy E. White, Acton, all of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 9, 1987, Ser. No. 130,699

Int. Cl.[4] G01J 5/06

U.S. Cl. 250—352 **4 Claims**



1. A prism cold shield for an infrared detector system comprising a prism-shaped substrate having an upper portion partially coated with a first film opaque to the radiation of interest and a lower portion partially coated with a second film opaque to the radiation of interest wherein windows formed by the first and second films acting in combination define a field of view for a plurality of infrared detectors in an array so as to cold shield the detectors in the linear direction of the detector array.

4,812,656

PROCESSING OF RADIOISOTOPE-DISTRIBUTION IMAGING SIGNALS IN A SCINTILLATION CAMERA APPARATUS

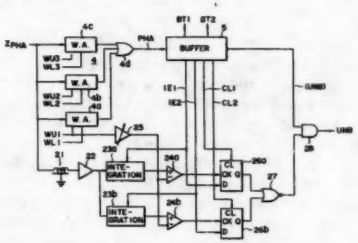
Tsutomu Yamakawa, and Hirofumi Iwao, both of Tochigi, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 30, 1987, Ser. No. 31,883

Claims priority, application Japan, Mar. 31, 1986, 61-74625; Apr. 9, 1986, 61-80038

Int. Cl.[4] G01T 1/164

U.S. Cl. 250—363 R **6 Claims**



1. A scintillation camera apparatus for obtaining an image of a subject into which radioisotopes have been injected, said apparatus comprising:

a scintillation camera for detecting gamma rays radiated from the radioisotopes, said scintillation camera outputting an X-coordinate signal, a Y-coordinate signal, and an energy signal, the X-coordinate signal and the Y-coordinate signal being indicative of the position of the radioisotopes and the energy signal including a plurality of pulses having a pulse height proportional to the energy of the detected gamma rays;

position calculating means connected to said scintillation camera for converting the X-coordinate signal and the Y-coordinate signal into positional imaging data;

energy imaging signal generating means connected to said scintillation camera for converting the energy signal into an energy imaging signal having a pulse height representative of the energy of the detected gamma rays;

pulse height analyzing means connected to said energy image signal generating means and responsive to the energy imaging signal for producing an imaging control signal when the pulse height of the energy imaging signal falls within a first window defined by predetermined upper and lower levels;

imaging means connected to said position calculating means, to said energy imaging signal generating means, and to said pulse height analzying means for producing an image of the subject in accordance with the positional imaging data, the energy imaging signal, and the imaging control signal ; and

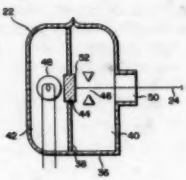
count error eliminating means connected to said scintillation camera and to said imaging means for selectively interrupting the production of the image in response to the energy signal, said count error eliminating means including integrating means connected to said scintillation camera for selectively integrating the energy signal and comparing means connected to said integrating means and to said imaging means for comparing the integrated energy signal with a second window defined by predetermined upper and lower levels.

4,812,657

MULTIUNIT TUBE AND A SPECTROPHOTOMETER

Tomiharu Minekane, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 921,273, Oct. 21, 1986, abandoned. This application Mar. 23, 1988, Ser. No. 172,957
Claims priority, application Japan, Oct. 31, 1985, 60-242653
Int. Cl.[4] G01J 1/20
U.S. Cl. 250—372 8 Claims



1. A spectrophotometer comprising:
a multiunit tube said tube comprising:
a casing, a partition wall dividing the inside of the casing into first and second chambers, said wall having an opening through which light is transmitted,
ultraviolet light-generating means located in the first chamber, and emitting an ultraviolet light beam.
visible light-generating means located in the second chamber, and emitting a visible light beam such that the optical axis of said visible light-generating means, the optical axis of said ultraviolet light-generating means and said opening are aligned;
a window formed in the casing, on the side of the first chamber, through which the ultraviolet and visible light beams, from the ultraviolet and visible light-generating means are emitted,
filter means disposed in said aligned opening of said partition wall, for reducing the luminous intensity of the visible light beam emitted from the window, said filter means having a high ultraviolet-spectrum transmittance and a low visible-spectrum transmittance, so low as to eliminate the influence of visible light on the measurement with said ultraviolet light;
means for positioning a sample directly in the light beam passing through said window;
spectroscopic means for separating the light beam, applied from the multiunit tube and transmitted through said sample, into spectral components; and
detecting means having a high detection sensitive to visible light and a low detection sensitivity to ultraviolet light, for detecting the spectral components delivered from the spectroscopic means such that spectral response of said detecting means is substantially constant throughout the range of visible to ultraviolet light.

4,812,658

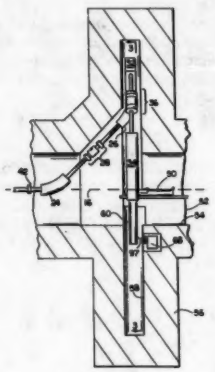
BEAM REDIRECTING

Andreas M. Koehler, Somerville, Mass., assignor to President and Fellows of Harvard College, Cambridge, Mass.

Filed Jul. 23, 1987, Ser. No. 76,868
Int. Cl.[4] G21K 1/08
U.S. Cl. 250—396 R 25 Claims

1. Apparatus for redirecting a particle beam from an initial direction lying along an initial axis, to a final direction lying in a plane which intersects said axis, said final direction being other than radially away from said axis, said apparatus comprising:

a first redirection structure for redirecting said beam from said initial direction to an intermediate direction lying in said plane, and



a second redirection structure for redirecting said beam within said plane from said intermediate direction to said final direction.

4,812,659

INFRARED SENSING DEVICE OUTPUTTING BLUE-GREEN LIGHT

Joseph Lindmayer, Potomac, Md., assignor to Quantex Corporation, Rockville, Md.

Continuation of Ser. No. 870,809, Jun. 6, 1986, which is a continuation-in-part of Ser. No. 786,095, Oct. 10, 1985, Pat. No. 4,705,952. This application Apr. 3, 1987, Ser. No. 34,497
Int. Cl.[4] H05B 33/00; C09K 11/08; B05D 5/06
U.S. Cl. 250—484.1 19 Claims

1. An infrared sensing device comprising:
a substrate, and
a photoluminescent material disposed on said substrate, said photoluminescent material comprising: a base material comprising substantially strontium sulfide, a first dopant of samarium provided in a quantity of between 70 to 300 parts per million by weight, and a second dopant of cerium oxide provided in a quantity of between 600 to 1500 parts per million by weight.

4,812,660

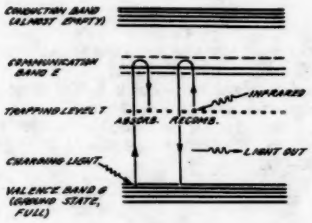
PHOTOLUMINESCENT MATERIALS FOR OUTPUTTING YELLOW-GREEN LIGHT

Joseph Lindmayer, Potomac, Md., assignor to Quantex Corporation, Rockville, Md.

Continuation-in-part of Ser. No. 870,809, Jun. 6, 1986, which is a continuation-in-part of Ser. No. 786,095, Oct. 10, 1985. This application Aug. 14, 1987, Ser. No. 85,465
Int. Cl.[4] H05B 33/00; B05D 5/06; C09K 11/08
U.S. Cl. 250—484.1 14 Claims

1. An electron trapping photoluminescent infrared stimulable phosphor having a peak infrared sensitivity within the range of 1.12 or 1.22 microns and emitting in response to infrared radiation an output of yellow-green light comprising:

a base material comprising substantially calcium sulfide;
a first dopant of samarium is provided in a quantity of between 50 and 300 part per million by weight, and a second



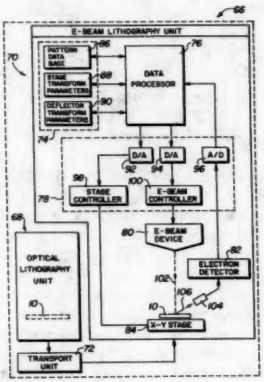
dopant selected from the group of cerium oxide, cerium flouride, cerium chloride, and cerium sulfide is provided in a quantity between 200 to 1500 part per million by weight.

4,812,661

METHOD AND APPARATUS FOR HYBRID I.C. LITHOGRAPHY

Geraint Owen, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 20, 1986, Ser. No. 898,451
Int. Cl.[4] H01J *37/304*
U.S. Cl. 250—491.1 **32 Claims**



1. A method for hybrid integrated circuit lithography, the method comprising the steps of:

(a) optically exposing an integrated circuit chip to produce optically exposed features including a plurality of chip marks, wherein said integrated circuit chip has an X-axis and a Y-axis, and wherein said chip marks include three chip marks arranged orthogonally to form a right angle proximate a perimeter of said integrated circuit chip;

(b) sequentially deflecting an E-beam to a plurality of said chip marks while maintaining said integrated circuit chip in a substantially stationary position to obtain numerical deflector parameters, wherein said deflector parameters include the variables: a (the scale change in X), b (the scale change in Y), m (the rotational error of the X axis), and n (the rotational error of the Y axis);

(c) moving said integrated circuit chip with the object of sequentially aligning a plurality of said chip marks with a substantially stationary E-beam to obtain a plurality of numerical stage parameters, wherein said stage parameters, include the variables: a' (the scale change in X), b' (the scale change in Y), m' (the rotational error of the X axis), and n' (the rotational error of the Y axis);

(d) numerically computing corrections to E-beam exposure data utilizing both said deflector parameters and said stage parameters; and

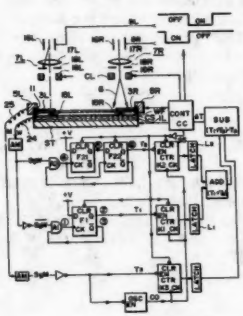
(e) E-beam exposing said integrated circuit chip to produce E-beam exposed features, wherein said computed corrections to said E-beam exposure data are used in the control of said E-beam exposing step.

4,812,662

ALIGNMENT SYSTEM USING AN ELECTRON BEAM

Susumu Goto, Hachiohji; Yuichi Kumabe, Atsugi, and Masahiko Okunuki, Itsukaichimuchi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 2, 1987, Ser. No. 9,872
Claims priority, application Japan, Feb. 6, 1986, 61-024653
Int. Cl.[4] G01B *15/00*; H01L *21/66*
U.S. Cl. 250—491.1 **3 Claims**



1. A device for detecting a relative position of first and second objects each having an electrically conductive mark, said device comprising:

means for irradiating the marks of the first and second objects with an electron beam;

detecting means for detecting the amount of electron beam absorbed by each of the marks of the first and second objects, said detecting means being connectable electrically to each mark so as to detect a current resulting from absorption by the marks of electrons from said electron beam; and

means for detecting the relative position of the first and second objects on the basis of an output from said detecting means.

4,812,663

CALORIMETRIC DOSE MONITOR FOR ION IMPLANTATION EQUIPMENT

D. H. Douglas-Hamilton, Beverly, and John P. Ruffell, Wenham, both of Mass., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jul. 25, 1986, Ser. No. 890,312
Int. Cl.[4] H01J *37/20*; G21K *5/08*
U.S. Cl. 250—492.2 R **10 Claims**

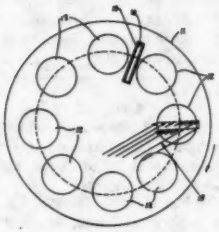
1. A method for determining ion beam dose during ion implantation of semiconductor wafers comprising the steps of:

accelerating a beam of ions and directing the ions to impinge upon an ion implant station;

moving one or more semiconductor wafers and a calorimeter having a beam facing surface through said ion beam to allow energy from the beam to be periodically transferred to the calorimeter as the one or more semiconductor wafers are treated by the ion beam;

coupling the beam facing surface of the calorimeter to a heat sink through a thermal path;

monitoring a thermal gradient along the thermal path created by heat transferred from the beam of ions to the beam facing surface of said calorimeter;



determining beam power impinging upon the calorimeter beam facing surface from the thermal gradient based upon the thermal characteristics of the thermal path; and

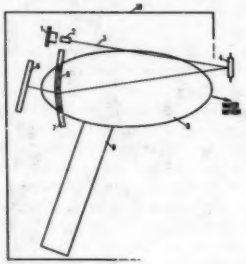
correlating beam power per unit area impinging upon the beam facing surface of the calorimeter with the dose of ions impinging upon the wafers.

4,812,664

APPARATUS FOR SCANNING A FLAT SURFACE TO DETECT DEFECTS

Peter G. Borden, Palo Alto, Calif., assignor to High Yield Technology, Mountain View, Calif.

Filed Nov. 12, 1987, Ser. No. 119,762
Int. Cl.[4] G01N *21/88*
U.S. Cl. 250—572 **10 Claims**



1. A surface defect scanner apparatus for use in vacuum equipment comprising:

means for moving a semiconductor wafer in a predetermined direction in a first plane defined by a surface of said wafer;

a source comprising a solid state laser diode for providing a light beam;

means for receiving said light beam from said source and for reflecting said light beam to said wafer, including means for scanning the surface of said wafer, said reflecting and scanning means comprising a scanning mirror for scanning the reflected beam in an arc across the surface of said wafer, said mirror having an axis disposed substantially perpendicular to said first plane so that the depth of field is virtually eliminated;

the angle of incidence of said beam from said source onto said reflecting means and the angle of reflection of said beam from said reflecting means to said wafer being less than 60°;

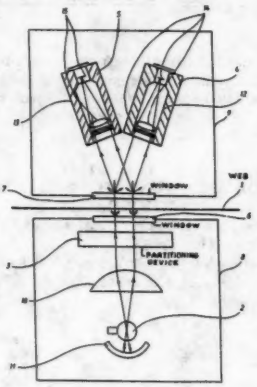
at least one photosensing element for detecting light scattered from the impingement of the reflected light beam on said wafer surface, the sensing surface of said element being at a relatively close height above said wafer, said height being in a second plane that is substantially parallel to said first plane and wherein said second plane is disposed between said first plane and said reflecting means.

4,812,665

METHOD AND APPARATUS FOR MEASURING OF HUMIDITY

Pertti Puumalainen, and Reijo Kuusela, both of Kuopio, Finland, assignors to Rolbox OY, Kuopio, Finland

Filed Mar. 16, 1987, Ser. No. 26,219
Int. Cl.[4] G01J *3/50*; G01N *21/27*
U.S. Cl. 250—571 **6 Claims**



5. An apparatus for measuring humidity in web material, comprising:

a pair of light-diffusing windows defining a space therebetween;

infrared source means positioned to a first side of said windows;

reference analyzer means positioned to a second side of said windows for measuring the intensity of light from said source means passing through the windows when no web is therebetween; and

measurement analyzer means positioned to said second side of said windows for measuring the intensity of light from said source means that has passed through said windows and a web therebetween, said reference analyzer means and said measurement analyzer means being angularly adjustable with respect to said windows.

4,812,666

POSITION FEEDBACK ENHANCEMENT OVER A LIMITED REPOSITIONING AREA FOR A MOVEABLE MEMBER

Per Wistrand, Binghamton, N.Y., assignor to Universal Instruments Corporation, Binghamton, N.Y.

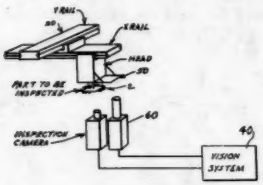
Filed Sep. 17, 1987, Ser. No. 97,679
Int. Cl.[4] G01N *21/86*
U.S. Cl. 250—561 **6 Claims**

1. A method of improving the precision of position recognition of a moveable spindle axis of a positioning system over that of an existing position feedback for the system within a particular area of repositioning of the axis, and comprising the steps of:

providing a mapping plate having an array of fiducials spaced sufficiently close together as to be locatable within a camera field of view by said existing positioning feed-

back and attaching said plate in fixed relation to said moveable axis;

providing a camera and vision system operatively as therewith which together are more precise than said existing position feedback system, and mounting said camera in fixed relation to a home reference of said positioning system;



situating said camera such that at least one of said fiducials is within a field of view of said camera over at least a limited area of repositioning of said axis;

determining a location of said axis within at least said limited area by said camera and vision system more precisely than obtainable by said encoder above.

4,812,667

PAST RECORD CORRECTING/READING APPARATUS

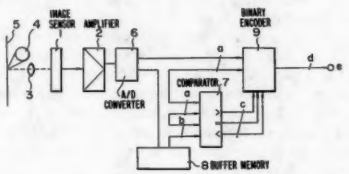
Kazuo Kobayashi, Suginami; Mitsuo Togashi, Kawasaki, and Satoshi Fukuda, Koganei, all of Japan, assignors to Matsushita Graphic Communication Systems, Inc., Meguro, Japan

Filed Oct. 20, 1986, Ser. No. 920,795

Claims priority, application Japan, Oct. 18, 1985, 60-233769; Oct. 24, 1985, 60-238050

Int. Cl.[4] H01J *40/14;* H04N *1/40*

U.S. Cl. 250—578 **17 Claims**



1. A past record reading apparatus including an optical device wherein an original document is illuminated by a light source, and light reflected from the original document is collected via a lens onto photosensitive elements, and an image sensor wherein said photosensitive elements are arranged in at least one line, a main scanning operation being performed by electronically switching photoelectric conversion outputs derived from said photosensitive elements and a sub-scanning operation being performed by relatively moving either said original document or said optical device; said past record reading apparatus comprising:

a first quantizing means for quantizing a photoelectric conversion output derived from said image sensor;

a memory means for successively storing scanning line information which is output from said first quantizing means every other scanning line;

a second quantizing means for further quantizing said scanning line information output from said first quantizing means; and,

a comparing means for comparing scanning line information stored in said memory means with scanning line information which has been obtained after said scanning line information was stored in said memory means, wherein a quantizing level of said second quantizing means is controlled in accordance with a result of said comparison by said comparing means.

4,812,668

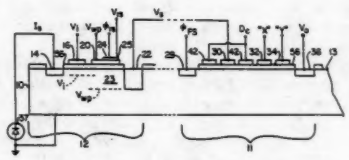
MULTIPLEXER ELEMENTS FOR PHOTOVOLTAIC DETECTORS

Mark N. Gurnee, Framingham, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 30, 1987, Ser. No. 129,323

Int. Cl.[4] H01J *40/14;* H01L *27/14*

U.S. Cl. 250—578 **15 Claims**



1. A multiplexer cell for a photovoltaic detector comprising:

input circuit means responsive to an input signal current for storing a charge which is a function of the input signal current over a predetermined integrating period of time periodically repeated, and for producing an output voltage signal which is a function of the magnitude of the charge stored during each of said integration periods; and

output circuit means responsive to the output voltage signal produced by the input circuit means and at least two concurrently applied enabling select signals for producing an output circuit output signal the magnitude of the voltage of which substantially equals the output voltage signal produced by the input circuit means.

4,812,669

HARMONIC SUPPRESSING DEVICE

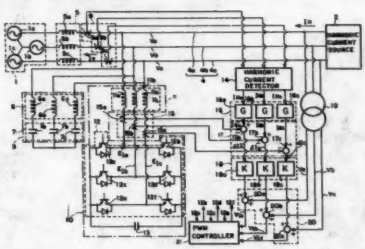
Masatoshi Takeda; Kazuo Ikeda; Yoshiharu Tominaga, and Kenji Mori, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 25, 1987, Ser. No. 66,203

Claims priority, application Japan, Jun. 26, 1986, 61-148102; Jun. 26, 1986, 61-148103; Jun. 26, 1986, 61-148104; Jun. 26, 1986, 61-148105; Jun. 27, 1986, 61-151963; Jun. 27, 1986, 61-151964; Nov. 21, 1986, 61-279079

Int. Cl.[4] H02P *13/30;* H02J *3/18*

U.S. Cl. 307—105 **9 Claims**



1. A harmonic suppressing device comprising:

a passive filter comprising a series connection of a capacitor and a reactor, and serving as a high-order higher harmonic filtering unit for filtering higher harmonic currents of comparatively high orders in a frequency band around a tuned point among higher harmonic currents generated by the higher harmonic current source of a power system;

an active filter serving as low-order higher harmonic filtering unit for filtering higher harmonic currents of comparatively low orders in a frequency band around an antiresonance point among those generated by said higher harmonic current source, connected in parallel to said passive filter and adapted so as to be controlled on the basis of a value obtained by multiplying the detected value of a higher harmonic current that flows into the power source side beyond the connecting point of said passive filter and a power source by a fixed gain;

said active filter comprising: a main active filtering circuit comprising a parallel connection of a plurality of switching transistors, diodes connected in parallel to said switching transistors, respectively, and a capacitor; and control means for controlling said switching transistors for on-off operation; and

said control means comprising a PWM control circuit capable of carrying out PWM control on the basis of a value obtained by processing through subtraction, amplification and addition the output of a gain circuit which executes a first order lag operation by multiplying the detected values of higher harmonic currents that flow into the power source side of said power system by a fixed gain, the detected current values of the output currents of said main active filtering circuit, and the detected voltage values of higher harmonic currents generated by said higher harmonic current source and flowing into the power source side of said power system.

4,812,670
THEFT PROTECTION CABLE AND CIRCUIT INCLUDING SAID CABLE

Michel Goulet, 18, rue Nelaton, F-75015 Paris, France

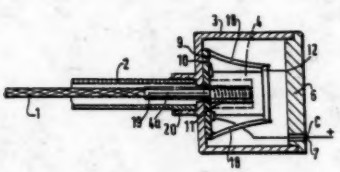
PCT No. PCT/FR86/00421, § 371 Date Aug. 6, 1987, § 102(e) Date Aug. 6, 1987, PCT Pub. No. WO87/03735, PCT Pub. Date Jun. 18, 1987

PCT Filed Dec. 5, 1986, Ser. No. 95,603

Claims priority, application France, Dec. 9, 1985, 85 18170; Feb. 26, 1986, 86 02631; Apr. 23, 1986, 86 05848; Jun. 4, 1986, 86 08034; Jun. 6, 1986, 86 08166; Jun. 18, 1986, 86 08773; Jun. 30, 1986, 86 09424; Jul. 30, 1986, 86 11023; Oct. 1, 1986, 86 13669

Int. Cl.[4] H01H *5/00*

U.S. Cl. 307—10.2 **11 Claims**



1. A theft protected electric cable comprising a conducting core, an insulating sheath surrounding the core and connection means, said cable being connected between an electric source and a user member by means of at least one contactor, the contactor comprising a housing, a first electrically conducting member and a second electrically conducting member in contact with the core, one of the conducting members being slidable within the housing between a first position wherein electrical current flows between the conducting members and a second position wherein no electrical current can flow between the conducting members, said core being permanently under mechanical tension to establish a mechanical and electrical contact between the conducting members, the said housing including no return means to prohibit the movement of the slidable conductive member from its second position to its first position, whereby the passage of electric current between the conducting members after a break of the cable will be prevented.

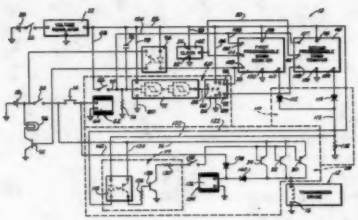
4,812,671
TRANSMISSION BRAKE DISENGAGEMENT CIRCUIT FOR A RACING AUTOMOBILE

Robert E. Furrow, Hinton, Okla., assignor to B. F. Electronics, Inc., Hinton, Okla.

Filed Jul. 26, 1988, Ser. No. 224,542

Int. Cl.[4] H01H *43/04*

U.S. Cl. 307—10.1 **9 Claims**



1. A circuit mountable on a racing automobile and operable by an electric power source for interposing a selected one of a plurality of preselected time delays between the opening of a manually actuable starting switch and the disengagement of an electrically actuated transmission brake of the racing automobile, comprising:

brake release means, electrically connecting the transmission brake to the power source, for providing electrical power to the transmission brake in a deactuated state of the brake release means and for interrupting the transmission of electrical power to the transmission brake in response to a countdown signal supplied to the brake release means;

a clock for providing a series of electrical clock pulses at a preselected rate;

a plurality of counters each connected to the clock to receive said clock pulses, wherein each counter is characterized as being of the type that will produce a countdown signal in response to the reception thereby of a preselected number of clock pulses in an enabled state of the counter;

countdown signal transmission means for transmitting the countdown signal produced by any counter to the brake release means; and

counter enabling means electrically connected between the starting switch and the counters for selecting a counter to be enabled upon closure of the starting switch and enabling such counter upon release of the starting switch.

4,812,672
SELECTIVE CONNECTION OF POWER SUPPLIES

Michael L. Cowan, Cary, and David C. Goodman, Durham, both of N.C., assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 1, 1987, Ser. No. 103,200

Int. Cl.[4] H02J *9/06*

U.S. Cl. 307—64 **11 Claims**

1. A method for simultaneously powering an electrical load from first and second power supplies, whereby said first power supply can be selectively disconnected from said electrical load in the event of a loss of power from said first power supply, said method comprising the steps of:

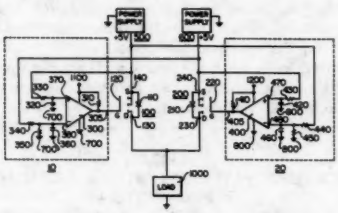
comparing voltage outputs of said first power supply and said second power supply;

providing a binary control signal indicative of the voltage output of said first power supply being above or below a predetermined threshold level;

operating an N-channel MOSFET, having at least source, drain, and gate terminals, such that:

said source terminal is connected to said first power supply; said drain terminal is connected to said electrical load; and said gate terminal is connected to said control signal, said MOSFET being responsive to said control signal;

connecting said first power supply to said load by driving said MOSFET to an on state with said control signal



when the voltage output of said first power supply is above said predetermined threshold level;

disconnecting said first power supply from said load by driving said MOSFET to an off state with said control signal when the voltage output of said first power supply is below said predetermined threshold level.

4,812,673

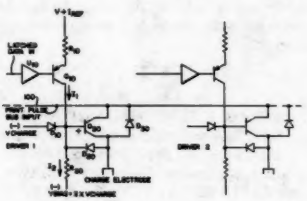
PRINT PULSE CONTROL CIRCUIT FOR ELECTROSTATIC FLUID JET APPLICATOR

Roger C. Burchett, Miamisburg, Ohio, assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Jul. 17, 1987, Ser. No. 74,562

Int. Cl.[4] G01D *18/00*

U.S. Cl. 307—106 **40 Claims**



1. In an electrostatic fluid jet applicator having control means for generating print timing signals, and means for selectively charging fluid droplets for controlling fluid deposition onto a moving substrate including at least one charging electrode, a drive circuit for generating high voltage print pulses for application to at least one charging electrode, said drive circuit comprising:

adjustable means, responsive to said print timing signals, for adjustably generating print pulses having a predetermined but adjustable rate of transition for controlling the rate of transition between the state of applying high voltage to said at least one charging electrode and the state of not applying high voltage to said at least one charging electrode; and

means for distributing said generated print pulses to said at least one charging electrode.

4,812,674

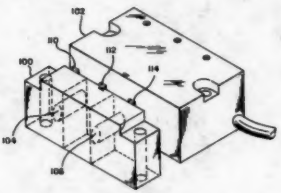
SAFETY GATE LIMIT SWITCH USING HALL EFFECT TRANSDUCER

Horace O. Sue, Asheville, N.C.; Richard T. Guttman, Palatine, Ill.; David M. Pendley, Fletcher, and William C. Keyz, Asheville, both of N.C., assignors to Square D Company, Palatine, Ill.

Continuation of Ser. No. 736,487, May 20, 1985, abandoned. This application Mar. 12, 1987, Ser. No. 23,885

Int. Cl.[4] H01L *29/82*

U.S. Cl. 307—116 **21 Claims**



1. A proximity switch comprising:

at least three magnetic field sensitive transducers mounted in a transducer housing, said at least three magnetic field sensitive transducers having a first conductive state in the presence of a magnetic field of predetermined magnitude and predetermined direction, and a second conductive state in the absence of a magnetic field having said predetermined magnitude and direction;

at least two magnets mounted in a magnet housing and each said at least two magnets capable of putting each said transducer into said first conductive state when one of said at least two magnets is placed near said transducer, and said at least two magnets positioned in said magnet housing so that when said magnet housing is located at a predetermined position relative to said transducer housing at least two of said transducers are in a magnetic field produced by said at least two magnets, said magnetic field capable of putting said transducers into said first conductive state and at least one of said transducers is in a magnetic field not capable of putting said transducers into said first conductive state;

a logic circuit responsive to the conductive states of said at least three transducers and capable of generating an output signal having a first value when said at least two of said transducers are in said first conductive state and at least one of said transducers is in said conductive state, and having a second value when said transducers have any other combination of conductive states; and,

an electronic switch, responsive to said output signal of said logic circuit said electronic switch capable of closing when said output signal has said first value and capable of opening when said output signal has said second value, so that said electronic switch is closed when said magnet housing is in said predetermined position relative to said transducer housing and is open for other relative positions of said magnet housing and said transducer housing.

4,812,675

SECURITY ELEMENT CIRCUIT FOR PROGRAMMABLE LOGIC ARRAY

Erich Goetting, Cupertino, Calif., assignor to Exel Microelectronics Incorporated, San Jose, Calif.

Filed Apr. 15, 1987, Ser. No. 38,276

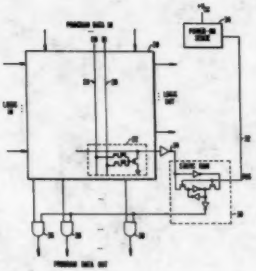
Int. Cl.[4] H03K *17/16, 19/94;* G06F *7/22*

U.S. Cl. 307—443 **7 Claims**

1. An improved security circuit for a programmable logic array having a plurality of programmable elements for providing output signals on logic outputs of said array responsive to

input signals on logic inputs to said array in accordance with programmed values of said programmable elements and having programming inputs to said programmable elements for programming said programmable elements and programming outputs from said programmable elements for verifying said programmed values, comprising:

a programmable security element for providing a security signal at a security output;



latching means, coupled to said security output, for storing a signal from said security output upon receiving an enable pulse at an enable input;

power-on sense means for providing said enable pulse to said latching means for a short period when power is applied to said programmable logic array; and

means, responsive to an output of said latching means, for disabling the reading of said programmed values of said programmable elements on said programming outputs.

4,812,676

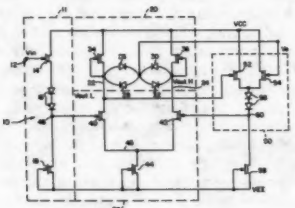
CURRENT MODE LOGIC SWITCHING CIRCUIT HAVING A SCHMITT TRIGGER

Ji L. Yang, Pal Alto, and Ronald J. Melanson, Sunnyvale, both of Calif., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Dec. 21, 1987, Ser. No. 135,457

Int. Cl.[4] H03K *3/354, 3/295, 5/08, 5/153*

U.S. Cl. 307—290 **7 Claims**



1. A current mode logic circuit having an output which changes, between a peak logical high voltage and a peak logical low voltage, comprising:

an input circuit means for receiving logical input voltages that shift between a peak logical high voltage and a peak logical low voltage, said shift occurring over a transition time period;

output circuit means including first and second output terminals, responsive to a change in current flow, for effecting a transition between said peak logical high voltage and said peak logical low voltage at the respective first and second output terminals corresponding to the logical input voltage;

switching circuit means operatively coupled to said output circuit means including first and second transistors operative to be switched between a respective conducting and non-conducting state in response to said shift in input voltage during said transition time period, said change in current flow corresponding to said input voltage;

triggering circuit means operatively connected to said first and second transistors responsive to the voltage at one of said first and second output terminals for delaying said switching of said transistors for a predetermined time during the transition time period; and

said transfer between the peak logical high and peak logical low output voltage occurs abruptly during a portion of the transition time period.

4,812,677

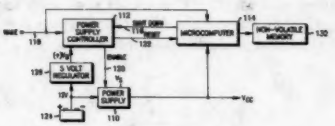
POWER SUPPLY CONTROL WITH FALSE SHUT DOWN PROTECTION

Richard D. Perry, Bartlett, Ill., assignor to Motorola, Schaumburg, Ill.

Filed Oct. 15, 1987, Ser. No. 109,362

Int. Cl.[4] H03K *19/003*

U.S. Cl. 307—296 R **4 Claims**



1. An arrangement for providing battery saving, fail-safe power supply control in response to an external wake signal which indicates whether or not the power supply should be active, comprising:

a power supply;

processing means, responsive to the external wake signal, for providing a shutdown indication to indicate when the power supply should be inactivated; and

control means, responsive to the external wake signal and to the shutdown indication, for controlling the activation of the power supply, wherein the control means validates the shutdown indication so as to provide fail-safe power supply control.

4,812,678

EASILY TESTABLE SEMICONDUCTOR LSI DEVICE

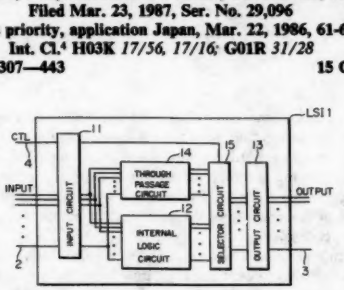
Seiichi Abe, 8-11, Nishisakawa-1-chome, Odawara-shi, Japan

Filed Mar. 23, 1987, Ser. No. 29,096

Claims priority, application Japan, Mar. 22, 1986, 61-64492

Int. Cl.[4] H03K *17/56, 17/16;* **G01R** *31/28*

U.S. Cl. 307—443 **15 Claims**



1. A semiconductor LSI device comprising:

an input circuit for receiving external signals having a predetermined level from the exterior of said LSI device to convert said external signals to input signals having an operation level of internal circuits of said LSI device;

an internal logic circuit connected to said input circuit for processing input signals supplied from said input circuit, said internal logic circuit including a sequencer logic;

a through-passage circuit connected to said input circuit for processing input signals supplied from said input circuit in accordance with significantly simpler logic than that of said internal logic circuit;

a selector circuit connected to said internal circuit and said through-passage circuit for selecting output signals of either one of said internal logic circuit or said through-passage circuit in accordance with a control signal supplied from the exterior of said LSI device; and

an output circuit connected to said selector circuit for converting a level of output signals of said selector circuit to the level of the external signals.

4,812,679

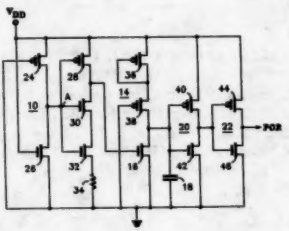
POWER-ON RESET CIRCUIT

John K. Mahabadi, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 9, 1987, Ser. No. 118,074

Int. Cl.[4] H03K *17/22, 17/20, 17/687, 5/153*

U.S. Cl. 307—272.1 **7 Claims**



1. A power on reset circuit for generating a reset signal when a first source of supply voltage is turned on, comprising:

a first node coupled to said first source of supply voltage;

a first means coupled to said first node for generating a threshold voltage when said first source of supply voltage is turned on;

a current source;

a switchable output stage for producing said reset signal;

a first P-channel field effect transistor having a source, drain and gate, said drain coupled to said first source of supply voltage;

a first N-channel field effect transistor having a drain coupled to the source of said first P-channel field effect transistor and having a source and gate;

a second N-channel field effect transistor having a drain coupled to the source of said first N-channel field effect transistor and having a source, the gates of said first P-channel field effect transistor and said first and second N-channel field effect transistors coupled to said first means for receiving said threshold voltage;

resistive means coupled between the source of said second N-channel field effect transistor and a second source of supply voltage, a trigger voltage being generated at the source of said first P-channel field effect transistor;

a first capacitor coupled between said output stage and said second source of supply voltage and coupled to said current source; and

steering means coupled to the source of said first P-channel field effect transistor and to said first capacitor and responsive to said trigger voltage for steering current to said first capacitor, said output stage generating said reset signal when the charge on said first capacitor reaches a predetermined value.

4,812,680

HIGH VOLTAGE DETECTING CIRCUIT

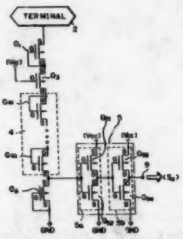
Hiromi Kawashima, and Atsushi Takeuchi, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 19, 1987, Ser. No. 27,936

Claims priority, application Japan, Mar. 19, 1986, 61-059468

Int. Cl.[4] H03K *5/153, 5/24*

U.S. Cl. 307—350 **3 Claims**



1. A high voltage detecting circuit included in a semiconductor device having a normal mode and a specific mode, comprising:

input terminal means for receiving an input signal having a normal input voltage being within a predetermined range and for receiving a specific mode signal having a voltage higher than said normal input voltage;

first power supply means for supplying a high potential to said semiconductor device;

second power supply means for supplying a low potential to said semiconductor device;

blocking transistor means, having a control electrode and first and second electrodes, said first electrode being operatively connected to said input terminal means and said control electrode being operatively connected to said first power supply means, said blocking transistor means being turned ON when a potential of said first electrode is higher by a threshold voltage of said blocking transistor means than a potential of said control electrode;

level shift means having an input and an output, said input being operatively connected to said second electrode of said blocking transistor means, for obtaining at said output of said level shift means, a potential lower, by a level shift value, than a potential of said input, said level shift means comprising at least one MIS transistor having a gate electrode, a source electrode, and a drain electrode, said gate and drain electrodes of said at least one MIS transistor being operatively connected to said input of said level shift means and said source electrode being operatively connected to said first end of said resistance means, said level shift value being determined by the threshold voltage of said at least one MIS transistor;

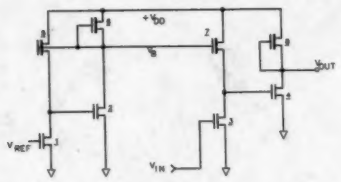
resistance means, having a first end operatively to said output of said level shift means and a second end operatively connected to said second power supply means, for keeping the potential of the output of said level shift means at the low potential of said second power supply means when a potential of said input terminal means is within said predetermined range of said normal input voltage; and

discrimination means, having a first end operatively connected to said output of said level shift means and to said first end of said resistance means, for outputting a control signal when a potential of the output of said level shift means is higher than a threshold voltage of said discrimination means, so as to switch said semiconductor device from said normal mode to said specific mode.

4,812,681
NMOS ANALOG VOLTAGE COMPARATOR

Edward G. Pumphrey, Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 11, 1987, Ser. No. 48,164
Int. Cl.[4] H03K 5/24
U.S. Cl. 307—362 9 Claims



1. An NMOS comparator circuit comprising:

a first comparator having a first comparator first input, a first comparator second input, and a first comparator output wherein the first comparator first input is connected to the first comparator output and the first comparator second input is connectable to a reference voltage signal;

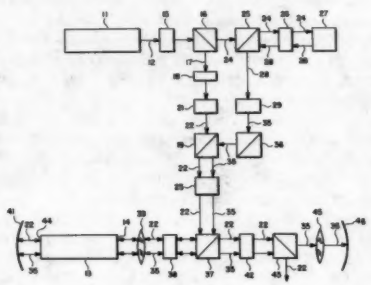
a second comparator having a second comparator first input, a second comparator second input, and a second comparator output wherein the second comparator first input is connected to the first comparator output, and the second comparator second input is connectable to an input reference voltage; whereby the output provides a digital voltage resulting from a comparison of the input voltage signal to the reference voltage signal; and

wherein each comparator is a cascaded inverter-pair.

4,812,682
SIMULTANEOUS ALL-OPTICAL LOGICAL OPERATIONS USING THE THIRD ORDER NONLINEAR OPTICAL EFFECT AND A SINGLE WAVEGUIDE

Richard B. Holmes, 260 Tremont St., Apt. #7, Melrose, Mass. 02176

Filed Mar. 21, 1988, Ser. No. 171,322
Int. Cl.[4] H03F 7/00
U.S. Cl. 307—425 19 Claims



1. Apparatus for performing an optical AND operation on two data carrying laser beams comprising:

(a) first means for generating a pump laser beam pulse having a predetermined first spatial profile, first frequency, first temporal modulation and first intensity;

(b) first modulating means for modulating said first spatial profile of said pump laser beam with second modulation representative of first data;

(c) optical waveguide means comprising a third order optically nonlinear material having a predetermined bandwidth and a predetermined Stokes frequency shift;

(d) first optical directing means for directing said first data encoded pump laser beam to and through said optical waveguide;

(e) second means for generating a Stokes laser beam pulse having a second spatial profile, a second frequency at least substantially equal to said pump laser beam frequency less said Stokes frequency shift, second temporal modulation at least substantially equal to said first temporal modulation of said pump laser beam, and a second intensity;

(f) second modulating means for modulating the said second spatial profile of said Stokes laser beam with third modulation representative of second data;

(g) second optical directing means for directing said second data encoded Stokes laser beam to and through said waveguide substantially simultaneously with and in a direction opposite to the direction of travel of said first data encoded pump laser beam and said second data encoded Stokes laser beam travel substantially simultaneously through said waveguide in opposite directions;

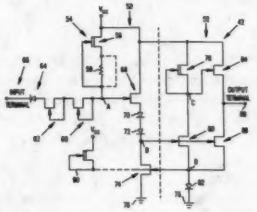
(h) laser beam utilization means; and

(i) third optical directing means for directing said Stokes laser beam exiting from said waveguide to said utilization means.

4,812,683
LOGIC CIRCUIT CONNECTING INPUT AND OUTPUT SIGNAL LEADS

Mark E. Fitzpatrick, San Jose, and Andrew C. Graham, Sunnyvale, both of Calif., assignors to Gazelle Microcircuits, Inc., Santa Clara, Calif.

Filed May 19, 1987, Ser. No. 51,984
Int. Cl.[4] H03K 19/094
U.S. Cl. 307—448 8 Claims



1. A logic circuit having an input signal lead for receiving an input signal, an output signal lead for providing an output signal, a first voltage supply terminal, and a second voltage supply terminal, comprising:

first and second transistors;

said first transistor having a first current handling terminal, a control terminal, and a second current handling terminal;

load means connected between the first voltage supply terminal and the first current handling terminal of the first transistor;

said second transistor having a first current handling terminal connected to the first voltage supply terminal, a control terminal connected to the first current handling terminal of the first transistor, and a second current handling terminal;

a first load device connected between the second current handling terminal of the second transistor and the second voltage supply terminal;

the control terminal of the first transistor being connected to the input signal lead;

a second load device connected between the second current handling terminal of the second transistor and the output signal lead; and

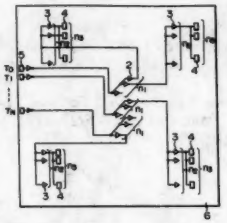
a third load device connected between the second current handling terminal of the first transistor and the second voltage supply terminal.

4,812,684

MULTIPHASE CLOCK DISTRIBUTION FOR VLSI CHIP

Akira Yamagiwa, and Toshihiro Okabe, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 22, 1988, Ser. No. 146,864
Claims priority, application Japan, Feb. 23, 1987, 62-37951
Int. Cl.[4] H03K *19/096*
U.S. Cl. 307—480 **6 Claims**



1. A large scale semiconductor logic device operated by a plurality of clock signals having different phases which is arranged on a chip, comprising:

(A) a plurality of input terminals for receiving said plurality of clock signals;

(B) a plurality of buffer circuits constructed in at least three stages in series connection, which are connected with each of said plurality of input terminals, in which first stage buffer circuits are arranged in the neighborhood of said input terminals and connected therewith and second stage buffer circuits are arranged at the central portion of the chip and connected with said first stage buffer circuits; and

(C) a plurality of load circuits receiving said plurality of clock signals through said plurality of buffer circuits, said plurality of load circuits being connected with final stage buffer circuits of said plurality of buffer circuits; between said second stage buffer circuits and said final stage buffer circuits, wirings are made between the buffer circuits belonging to successive stages so that the path lengths therebetween are substantially equal and each of certain stage buffer circuits is connected with the same number of subsequent stage buffer circuits; and wirings are made between the final stage buffer circuits and the load circuits so that the path lengths therebetween are substantially equal and each of the final stage buffer circuits is connected with the same number of load circuits.

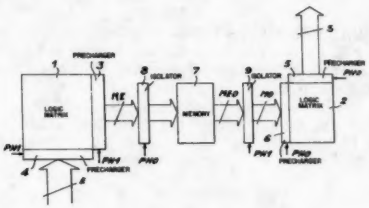
4,812,685

DYNAMIC LOGIC ARRAY WITH ISOLATION AND LATCHING MEANS BETWEEN PLANES

Francois Anceau, Plaisir, France, assignor to Bull, S.A., Paris, France

Filed Feb. 10, 1988, Ser. No. 154,340
Claims priority, application France, Feb. 12, 1987, 87 01741
Int. Cl.[4] H03K *19/177, 19/096*
U.S. Cl. 307—481 **12 Claims**

1. A logic array comprising a first matrix (1) of logical gates having output signals (ME) which are transmitted to inputs (MO) of a second matrix (2) comprising one or more logical gates, each logical gate of said matrices (1, 2) having an input line and an output line and being of the dynamic type, operating during a functional phase preceded by a precharging phase, said precharging phase serving to charge the output lines (MEi, S) of said logical gates to a predetermined voltage (Vdd) by precharging means (3, 4, 5, 6) that are made active by a precharging control signal, said array including memorizing means (7) having inputs which are connected to the output lines of the gates of the first matrix (1) by way of first controlled isolating means (8), and having outputs (MEO) connected to the input lines of the gates of the second matrix (2) by way of second controlled isolating means (9), said first controlled isolating means (8) being controlled for authorizing the



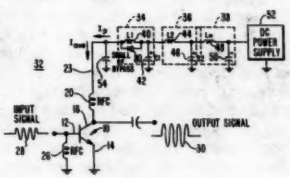
transfer of the signals emitted by the first matrix (1) to said memorizing means (7) during the precharging phase (PHO) of the second matrix (2), and said second controlled isolating means (9) being controlled for authorizing the transfer of the data contained in said memorizing means (7) to the second matrix (2) during the precharging phase (PHI) of the first matrix (1).

4,812,686

PULSE AMPLIFIER

Alfred W. Morse, Ellicott City, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 3, 1987, Ser. No. 92,966
Int. Cl.[4] G06G *7/10, 7/11*
U.S. Cl. 307—491 **15 Claims**



1. A pulsed amplifier, comprising;

an electronic switching device, having input electrode means and output electrode means operative to switch between a conducting and nonconducting state in response to the application of spaced pulses to the input electrode means for producing corresponding spaced pulses on the output electrode means, said switching device being capable of withstanding without breakdown, a DC voltage having a first level applied to the output electrode means during the nonconducting state and having an operating DC voltage with a second level less than the first level for application to the output electrode means during the conducting state;

a plurality of circuit sections electrically connected to the output electrode means, each of the circuit sections including an inductance and a capacitance, each inductance being series connected to one another, each capacitance being connected in parallel to each other between each respective inductance;

a DC voltage source electrically connected to the output electrode means in series with the plurality of circuit sections for charging during the non-conducting state the capacitance of each circuit section with current having a voltage substantially corresponding to the first value; and

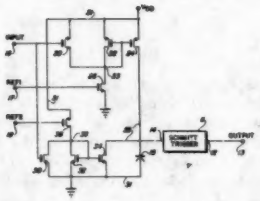
the inductance and capacitance of each of the circuit sections having a value effective to discharge the capacitance of each circuit section successively at a decreasing frequency for reducing the applied voltage of the first value to an applied voltage having the second value during a selected first portion of the pulse and maintaining the second voltage value for the duration of the pulse.

4,812,687

DUAL DIRECTION INTEGRATING DELAY CIRCUIT

Tony R. Larson, and Larry L. Tretter, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 13, 1988, Ser. No. 218,728
Int. Cl.[4] H03K 5/13, 3/29; G05F 3/16
U.S. Cl. 307—601 **5 Claims**



1. A CMOS circuit comprising:

first and second interconnected FET devices switchable between complementary on and off states in response to the leading and trailing edges of an input pulse;

first and second FET current mirrors connected to, respectively, said first and second FET devices, switchable between active and inactive states;

voltage charging means connected to reference voltages and said first and second current mirrors whereby the voltage charging means receives charge during an active state of said first current mirror and loses charge during an active state of said second current mirror; and

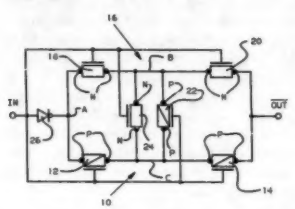
voltage responsive means connected to said charging means for providing a first output signal when the voltage of the charging means exceeds a predetermined level and a second output signal when the voltage on said charging means is below another predetermined level.

4,812,688

TRANSISTOR DELAY CIRCUITS

Albert M. Chu, Essex Junction, and William R. Griffin, Shelburne, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1987, Ser. No. 139,551
Int. Cl.[4] H03K 5/04, 3/017, 17/687, 17/284
U.S. Cl. 307—605 **23 Claims**



1. A signal delay circuit comprising

an input terminal,

an output terminal,

first and second circuits arranged parallel to each other and disposed between said input and output terminals, said first circuit having serially connected first and second transistors and said second circuit having a third transistor,

a fourth transistor connected from the common point between said first and second transistors to said second circuit,

means for applying a signal to said parallelly arranged first and second circuits,

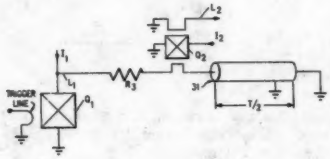
turning on said first, second and fourth transistors, and means for selectively turning on said third transistor.

4,812,689

INCREMENTAL TIME DELAY GENERATOR

Steve Whiteley, Shrub Oak, N.Y., assignor to Hypres, Inc., Elmsford, N.Y.

Filed Aug. 28, 1987, Ser. No. 90,377
Int. Cl.[4] H03K 5/13, 5/153
U.S. Cl. 307—605 **14 Claims**



1. An incremental time delay generator disposed on a substrate for producing an output signal at a variable time delay in response to a trigger signal, comprising:

means for generating a first signal in response to said trigger signal wherein said means for generating comprises a first Josephson junction device that switches from a zero voltage state to a non-zero voltage state when said trigger signal is received;

means for converting said first signal into an intermediate signal having an instantaneous value that varies at each of one or more fixed time intervals; and

means responsive to said intermediate signal for producing said output signal at a time delay determined by when said instantaneous value of said intermediate signal exceeds a predetermined threshold wherein said means responsive to said intermediate signal comprises a second Josephson junction device that switches from a zero voltage state to a non-zero voltage state when said instantaneous value of said intermediate signal exceeds said predetermined threshold.

4,812,690

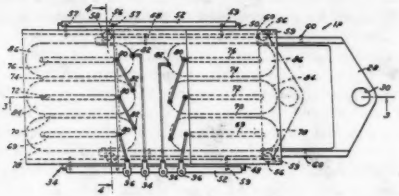
SOLENOID ACTUATORS

John L. Ellertsen, Birmingham, Mich., assignor to G. & E. Engineering Ltd., Birmingham, Mich.

Continuation of Ser. No. 589,727, Mar. 15, 1984, abandoned, which is a continuation-in-part of Ser. No. 323,239, Nov. 20, 1981, abandoned. This application Feb. 5, 1987, Ser. No. 11,499
Int. Cl.[4] H02K 33/12; H01F 7/08
U.S. Cl. 310—27 **37 Claims**

1. A solenoid actuator comprising a ferromagnetic armature having an edge, means including a frame mounting said armature for movement through a defined path having a component of movement perpendicular to said edge, and a stator carried by said frame and oriented with respect to said armature to be electromagnetically coupled to said armature for drawing said armature in the direction of said component on said path, said stator comprising at least one pole piece of ferromagnetic construction oriented in the direction of said component, an electrical coil comprising a plurality of laminations of conduc-

tive ribbon material spirally coiled on edge in a plane around said at least one pole such that the soil edge plane is perpendic-



ular to said movement component of said armature, and means for connecting said coil to a source of electrical power.

4,812,691

DEVICE FOR IMPROVING THE STABILITY OF ROTATION OF THE ROTOR OF A SINGLE-PHASE SYNCHRONOUS MOTOR

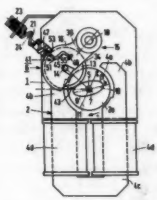
Leo Bertram, Stolberg, Fed. Rep. of Germany; Hugo Schemmann, Schaesberg, Netherlands, and Gerhard Diefenbach, Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Filed Apr. 16, 1987, Ser. No. 40,448

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1986, 3610771

Int. Cl.[4] H02K *7/10, 7/118*

U.S. Cl. 310—41 **11 Claims**



1. A device for improving the rotational stability of the rotor of a single-phase synchronous motor said device comprising:

a motor exhibiting an average torque on which strong alternating torques are superimposed and having a drive shaft driving a rotating load; said motor also comprising a magnetic rotor having a detent torque and arranged in an apparatus housing between a stator comprising exciter coils;

a cam-and-follower mechanism mounted on said drive shaft and comprising at least one radial surface, at least one lever arm and at least one follower wheel journalled therein, for exerting an additional mechanical compensation torque which acts outside the load-transmission path and which counteracts the electromechanical alternating torques of the motor during nominal operation in one predetermined direction of rotation;

a resilient blocking element arranged between the lever arm and the follower wheel, which blocking element bears against a radial surface of the cam-and-follower mechanism and blocks the rotation of the rotor in a direction other than the predetermined direction at the same time that the said mechanism acts to counteract the electromechanical alternating torques of the motor; and

wherein the detent torque and the mechanical compensation torque rotate the rotor sufficiently far out of the parallel position of the stator field and the rotor field to enable starting for the prevailing starting friction.

4,812,692

MOTOR

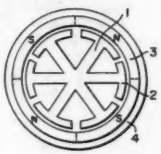
Yoji Arita, Nagareyama, Japan, assignor to Mitsubishi Chemical Industries Limited and Mitsubishi Steel MFG Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 856,354, Apr. 28, 1986, abandoned. This application Jan. 29, 1988, Ser. No. 149,923

Claims priority, application Japan, Apr. 30, 1985, 60-90980

Int. Cl.[4] H02K *23/40*

U.S. Cl. 310—49 R **10 Claims**



1. A motor comprising magnetic poles constituted by a permanent magnet magnetized in its radial direction and a core with salient poles placed inside or outside said magnetic poles wherein the salient poles are distributed at equal angular positions and wherein said magnetic poles have the same surface area, and wherein the magnetic flux distribution of the pattern of magnetization formed by said poles is a function of the spacings of the poles of the permanent magnet such that in the cogging torque characteristics of said motor, there are four inflection points in a period of the cogging torque of a revolution angle (360°/i) having balanced table points as standards, where i is the least common multiple between the number of said salient poles and the number of said magnetic poles.

4,812,693

SOLDERLESS CONNECTION FOR AN ELECTRIC MOTOR

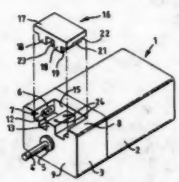
Roger F. Baines, Repulse Bay, Hong Kong, assignor to Johnson Electrical Industrial Manufactory, Limited, Chaiwan, Hong Kong

Filed Aug. 10, 1987, Ser. No. 83,285

Claims priority, application United Kingdom, Aug. 11, 1986, 8619549

Int. Cl.[4] H02K *11/00;* **H01R** *13/38*

U.S. Cl. 310—71 **6 Claims**



1. A fractional horsepower permanent magnet direct current motor, comprising a housing having an end cap, brush gear mounted in the end cap, said brush gear comprising a brush leaf carrying a brush, said brush leaf having a terminal part which projects through a wall of the end cap into a recess in an outer surface of the end cap, a member secured to the housing and movable between first and second positions, said member projecting partially into said recess in said first position defining a channel for insertion of a supply lead wire into the recess and being housed fully in said recess in said second position, said member and said housing each having a cooperating surface, said cooperating surfaces being arranged to squeeze the terminal part against the supply lead wire and trap the supply lead wire in electrical connection with said terminal part as

said member is moved from the first position to the second position.

4,812,694

CONTACT FREE MAGNETIC BEARING

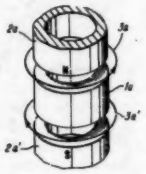
Johan K. Fremery, Bonn, Fed. Rep. of Germany, assignor to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Continuation of Ser. No. 113,516, Jan. 21, 1980, abandoned, which is a continuation of Ser. No. 854,093, Nov. 23, 1977, abandoned, which is a continuation-in-part of Ser. No. 613,266, Sep. 15, 1975, abandoned. This application Mar. 1, 1982, Ser. No. 353,093

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1974, 2444099

Int. Cl.[4] F16C *39/06*

U.S. Cl. 310—90.5 24 Claims



1. A contact-free magnetic bearing assembly having a member supported magnetically for movement relative to a support structure, spaced magnetic poles positioned facing one another and also having opposite polarities of those poles which face one another, said poles forming a continuous magnetic circuit having a magnetic path between said poles, a magnetic member between said poles through which said magnetic path passes to support said magnetic member for movement in said path and relative to said poles, the opposite magnetic poles producing a stray range bordering said path adjacent said movable member and adjacent the gaps between the movable member and the opposite magnetic poles, electromagnetic means adjacent said path in said stray range bordering said gaps forming a magnetic field parallel to said magnetic path to produce opposed magnetic forces acting on said magnetic member adjacent the opposite poles to oppose movement of said member out of said path, and sensing means detecting changes in position of said magnetic member relative to said poles and altering the current flow through said electromagnetic means to oppose movement of said magnetic member out of said path between said poles.

4,812,695

ANNULAR STATOR CORE CONSTRUCTION

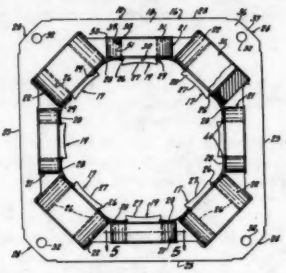
Millis V. Parshall, Erie, Pa., assignor to Marathon Electric Manufacturing Corporation, Wausau, Wis.

Filed Aug. 15, 1986, Ser. No. 897,132

Int. Cl.[4] H02K *1/12*

U.S. Cl. 310—258 3 Claims

1. A eight pole stator unit for an eight pole A.C. generator, comprising a stacked laminated core including a plurality of essentially identical one-piece lamination having a substantially square outer configuration and an inner circular opening defined by a plurality of circumferentially integral magnetic poles, said poles being joined by an encircling substantially square peripheral base, said poles including a first set of four poles located one each of the center of each side of said square core, said poles being essentially identically constructed and projecting inwardly from the peripheral base and having an inner circular face forming a common circle, said poles being formed with circumferentially located straight side walls and straight axial end walls throughout the total length of the poles to provide unobstructed movement over the poles, a precision wound coil located on said pole, said precision wound coil mating with said pole and having a total depth less than the total length of said pole, a second set of four poles located one each centrally between the adjacent first poles and each having a cross-section essentially the same as said first poles, and said second poles being essentially identically constructed and being substantially longer than said first poles and having an inner circular face, said poles extending from said corner portions of said core and projecting inwardly from said base with the inner face terminating on the common circle with said first poles, said second poles having circumferentially located straight side walls and straight axial end walls to allow unobstructed movement of a precision coil over said pole, second precision wound coils having an axial length corresponding to slightly less than the length of the second pole, said second



coils being telescoped and placed over said second poles abutting the peripheral base and with the outer end face spaced inwardly form the end of the corresponding core, electrical insulation between said poles and abutting the sidewalls of each pole, each of said coils having a central opening with circumferentially spaced sidewalls abutting the insulation and axial end walls spaced from said axial walls of the pole to form vented turns for each said coil, bridging clamp members formed of stiff flexible material and interposed between the adjacent poles and having end edges engaging the sides of the immediately adjacent poles, and said clamp members engaging the outer end faces of the coils and serving to firmly clamp the coil onto the poles with the opposite end face of the coil abutting the peripheral base.

4,812,696

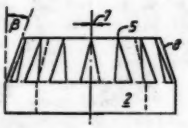
MOTOR CORE WITH WINDING SLOTS HAVING REDUCED AIR GAPS

Louis Stanley, Taglieberstrasse, 1230 Vienna 23, Austria

Filed Feb. 17, 1987, Ser. No. 15,628

Int. Cl.[4] H02K *15/02, 3/48*

U.S. Cl. 310—216 5 Claims



1. A magnet core for an electrical machine comprising a helically wound coil of electric strip having a coil axis, said strip having transverse slits extending from a first edge across part of its width and being separated by tongues such that the slits in successive turns of the coil co-operate to define slots extending generally radially of the coil to receive electrical windings, electrical windings being housed in said slots and said tongues being bent inwardly towards the coil axis so as to

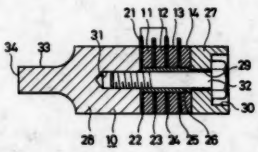
close the slots at their upper ends to leave substantially no air gap.

4,812,697

ULTRASONIC VIBRATOR AND A METHOD OF CONTROLLINGLY DRIVING SAME

Shoji Mishiro, Kanagawa, Japan, assignor to Taga Electric Co., Ltd., Tokyo, Japan

Filed Apr. 3, 1987, Ser. No. 34,024
Claims priority, application Japan, Apr. 9, 1986, 61-81922; Aug. 13, 1986, 61-189844
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—323 7 Claims



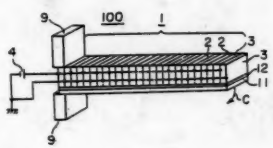
1. An ultrasonic vibrator comprising:
at least one torsional electrostrictive transducer for torsional vibration;
at least one longitudinal electrostrictive transducer for longitudinal vibration having substantially the same shape and size as said at least one torsional transducer; and
a pair of metallic members firmly, coaxially and integrally holding said at least one torsional electrostrictive transducer and said at least one longitudinal electrostrictive transducer therebetween; one of said metallic members having an altered section formed in such a shape whereby the torsional resonant frequency and the longitudinal resonant frequency of said vibrator coincide with each other.

4,812,698

PIEZOELECTRIC BENDING ACTUATOR

Yuko Chida; Tetsuhiko Nishimura, and Yasuo Oguri, all of Yokohama, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Sep. 29, 1987, Ser. No. 102,397
Claims priority, application Japan, Sep. 29, 1986, 61-228426; Dec. 27, 1986, 61-309189; Dec. 27, 1986, 61-309190
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—330 9 Claims



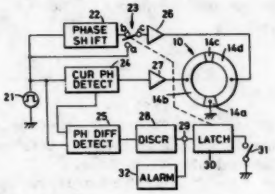
1. A piezoelectric actuator comprising a longitudinal effect-type laminated piezoelectric element composed of piezoelectric ceramic sheets, laminated in their thickness direction, and a supporting member made of a ceramic material having a Young's modulus of at least 2.5 times the Young's modulus of the piezoelectric element and fixed to one side in the longitudinal direction of said piezoelectric element and being bendable and capable of constraining expansion of the element, wherein the thickness, t_2, of said piezoelectric element is within a range of from 100 μm to 5000 μm, and the ratio of t_2/t_1, where t_2 is the thickness of said piezoelectric element t_1 is the thickness of said supporting member, is at least 1.6.

4,812,699

DRIVE CONTROL DEVICE IN AN ULTRASONIC VIBRATION MOTOR

Hidehiro Ogawa, and Kazuyuki Kazami, both of Tokyo, Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Nov. 6, 1987, Ser. No. 117,328
Claims priority, application Japan, Nov. 11, 1986, 61-268275; Feb. 19, 1987, 62-36175; Feb. 19, 1987, 62-36176
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—316 8 Claims



1. An ultrasonic vibration motor comprising:
a moving member;
a vibration member contacted by said moving member;
electrostrictive means provided on said vibration member;
power supply circuit means for applying a pair of periodic voltages having a predetermined phase difference therebetween to a pair of parts of said electrostrictive means, respectively, to generate a travelling vibration wave in the surface of said vibration member;
means for detecting a variation in the load of said moving member; and
control means for controlling said power supply circuit means to change said phase difference between said pair of periodic voltages so as to generate a standing vibration wave in the surface of said vibration member instead of said travelling vibration wave when said detected load exceeds a reference value.

4,812,700

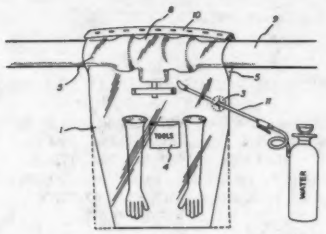
PORTABLE CONTAINMENT DEVICE FOR TREATMENT OF HAZARDOUS MATERIALS

Thomas Natale, Moorestown, N.J., assignor to GPAC, Inc., Cinnaminson, N.J.

Continuation-in-part of Ser. No. 777,560, Sep. 18, 1985, Pat. No. 4,626,291, which is a continuation of Ser. No. 543,850, Oct. 20, 1983, abandoned. This application Dec. 1, 1986, Ser. No. 936,509
The portion of the term of this patent subsequent to Dec. 2, 2003, has been disclaimed.
Int. Cl.[4] B08B *5/04*
U.S. Cl. 312—1 26 Claims

1. A disposable device adapted for receiving asbestos insulation and like hazardous materials, said disposable device comprising:
a length of heat resistant lay-flat tubing forming a bag, said bag being flexible and collapsible and including
two sides,
two side edges formed by opposed folds of said bag,
a top edge and a bottom edge of said bag, said bottom edge being sealed to close off a bottom of said bag and said top

edge being open for entry of said asbestos insulation and like hazardous materials into the interior of said bag, and



glove means sealed to one of said two sides of said bag for protected access to the interior of said bag from the exterior of said bag.

4,812,701

COVER APPARATUS FOR WEIGHING MACHINES

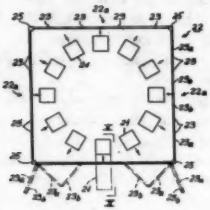
Asashiro Izumi, Kurita, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Continuation of Ser. No. 757,557, Jul. 22, 1985, abandoned, which is a division of Ser. No. 417,117, filed as PCT JP81/00395 on Dec. 17, 1981 published as WO82/02430 on Jul. 22, 1982, Pat. No. 4,545,630. This application Mar. 27, 1987, Ser. No. 31,194

Claims priority, application Japan, Jan. 9, 1981, 56-2064; Jul. 11, 1981, 56-103020

Int. Cl.[4] A47B *81/00*

U.S. Cl. 312—285 **2 Claims**



1. A plurality of weighing machines in combination with a cover apparatus, comprising:

a plurality of weighing machines arranged in turn in a predetermined array or pattern; and

a cover apparatus, including a plurality of peripherally divided and interconnecting cover sections positioned around and outside of said plurality of weighing machines, such that said cover sections conjointly encircle said weighing machines in their entirety, and

a support base for supporting each of said weighing machines and said cover sections in their position encircling said plurality of weighing machines, said support base having an opening therein, between said weighing machines, through which a chute for receiving and channeling contents discharged from said plurality of weighing machines, extends, such that said chute is substantially disposed outside of said cover apparatus, and

wherein each of said cover sections includes, a plurality of foldably connected panels, with neighboring panels of said cover sections being connected together in the manner of hinged doors, such that the cover apparatus has the contour of a polygon, each side of which is formed by at least a pair of said cover sections.

4,812,702

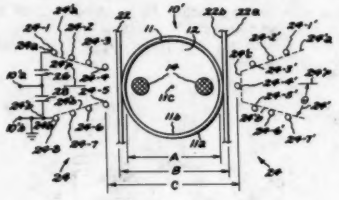
EXCITATION COIL FOR HID ELECTRODELESS DISCHARGE LAMP

M. John Anderson, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 28, 1987, Ser. No. 138,005

Int. Cl.[4] H01J *1/50*

U.S. Cl. 313—153 **20 Claims**



1. An excitation coil, for stimulating a high intensity discharge plasma in an electrodeless discharge lamp, comprising:

at least one turn of a conductor arranged generally upon an exterior surface of a torus having a substantially V-shaped cross-section; and

means for tuning the inductance of the toroidal conductor to a desired resonance frequency.

4,812,703

ELECTRIC LAMP ASSEMBLY

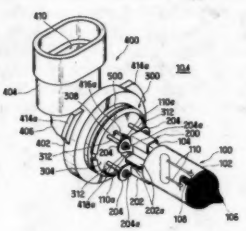
Susumu Kanematsu, and Kenji Ishii, both of Kitawaki, Japan, assignors to Koito Seisakusho Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1986, Ser. No. 943,431

Claims priority, application Japan, Dec. 19, 1985, 60-286707; Dec. 19, 1985, 60-286708; Dec. 19, 1985, 60-286709; May 23, 1986, 61-118868; Aug. 8, 1986, 61-186577; Sep. 26, 1986, 61-227842

Int. Cl.[4] H01J *5/48*

U.S. Cl. 313—318 **32 Claims**



1. An electric lamp assembly comprising:

a bulb unit with a filament;

a bulb holder tightly holding said bulb unit,

said bulb holder comprising:

a separate rectangularly looped band portion;

foot portions radially outwardly projected from one end of said band portion

and having at least three openings formed therein;

a core structure of molded plastics;

parallel supporting pins which are arranged to adjust the distance between said filament and said core structure, each supporting pin having one end tightly embedded in said core structure and another end tightly received and secured to one of said openings of said bulb holder;

a base structure of molded plastics constructed so as to be

essentially hollow and having an entrance in which said core structure is snugly received;

stopper means formed in each of said core and base structures for preventing relative rotation therebetween; and

elongate conducting members extending through the hollow of said base structure, each member having one end connected to said filament through a lead wire and another end placed in a given portion of said hollow;

lug portions radially outwardly projected from the other end of said band portion, said band portion being sized and constructed to grip a rectangular hermatic seal portion of said bulb unit, said foot portions being connected to said supporting pins by welding.

4,812,704

COLOR TELEVISION DISPLAY TUBE

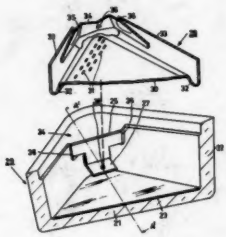
Robert F. L. M. Van der Ven, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 533,628, Sep. 19, 1983, abandoned, which is a continuation of Ser. No. 270,445, Jun. 4, 1981, abandoned. This application Dec. 5, 1984, Ser. No. 678,374

Claims priority, application Netherlands, Jun. 23, 1980, 8003609

Int. Cl.[4] H01S *29/06*

U.S. Cl. 313—402 **11 Claims**



1. A color display tube including an envelope having a rectangular display window, a rectangular color selection electrode having a plurality of apertures, and four suspension means for mounting corners of the rectangular color selection electrode to respective corners of the rectangular display window, each of said suspension means being sufficiently resilient to prevent deformation thereby of the color selection electrode, and comprising:

a. a first suspension element including a substantially flat portion having an opening with predefined contact points; and

b. a second suspension element including a projecting portion for extending into the opening of the first suspension element and contacting the predefined contact points along the perimeter of said opening;

said first element being permanently connected to said second element at said predefined contact points by connections having sufficient elasticity to enable limited pivotal movement of said first and second elements relative to each other;

one of said first and second elements in each suspension means being affixed to a corner of the color selection electrode and the other of said elements being affixed to the respective corner of the display window.

4,812,705

ARTICLE SUPPORTING STUD AND CRT FACE PANEL EMPLOYING SAME

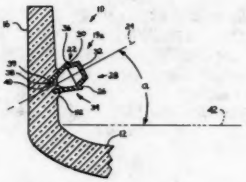
Arthur J. Wagenknecht, York, Pa.; John R. Anderson, Naugatuck, Conn., and Joseph A. Guzikowski, York, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 902,345, Aug. 29, 1986, Pat. No. 4,755,713. This application Dec. 17, 1987, Ser. No. 134,484

The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.

Int. Cl.[4] H01J *29/07*

U.S. Cl. 313—406 **7 Claims**



1. An article supporting stud for corner mounting in a cathode ray tube face panel, said stud comprising: a hollow body having a substantially uniform wall thickness, said wall being symmetrically arrayed about a longitudinal axis; a shoulder portion having a given diameter extending normal to said longitudinal axis; a frusto-conical head axially projecting from said shoulder portion in a first direction, said head having a base and a summit, said base being integral with said shoulder and having a diameter less than said given diameter; and a frusto-conical skirt portion axially projecting from said shoulder portion in a second direction opposite from said first direction, said skirt portion having a base and a summit, said base of said skirt portion being integral with said shoulder and having a diameter equal to said given diameter.

4,812,706

DEVICE FOR CORRECTING THE DEFLECTION EFFECT DUE TO A VARIATION OF THE FOCUSING VOLTAGE IN A TRICHROMATIC CATHODE RAY TUBE WITH IN LINE CATHODES

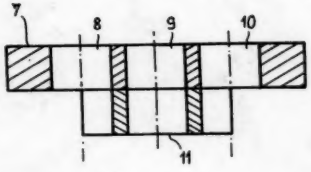
Jacques Baudry, Ecully, and Gérard Proudhon, Venissieux, both of France, assignors to Videocolor, Montrouge, France

Filed Nov. 19, 1986, Ser. No. 932,291

Claims priority, application France, Nov. 22, 1985, 85 17333

Int. Cl.[4] H01J *29/56*

U.S. Cl. 313—414 **9 Claims**



1. A device for correcting the deflection effect due to the variation of the focusing voltage in a trichromatic cathode ray tube with in line cathodes, of the type having five or six focusing grids and with a first plurality of said focusing grids forming a pre-focusing lens and with a second plurality of said grids forming a main focusing lens, wherein said focusing grids include a second flat grid and a fourth oblong grid having three aligned circuit or holes, wherein the fourth grid is one of said plurality of grids forming said pre-focusing lens and wherein said fourth grid is such that the geometric characteristics of the

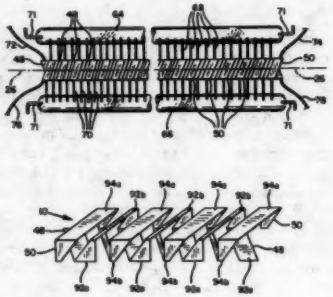
peripheral portion facing the central hole of the grid are different than the geometrical characteristics of the rest of its periphery, when taken with respect to its center of origin.

4,812,707

TRAVELING WAVE PUSH-PULL ELECTRON BEAM DEFLECTION STRUCTURE HAVING VOLTAGE GRADIENT COMPENSATION

Ronald E. Correll, Tualatin, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 30, 1987, Ser. No. 114,466
Int. Cl.[4] H01J *29/70*
U.S. Cl. 313—435 **15 Claims**



1. An electron beam deflection structure for use in an electron discharge tube having a central longitudinal axis extending along the direction of electron beam propagation, comprising:

a pair of bifilar helical coils coaxial with said central longitudinal axis, each of said coils including alternating plate segments of substantially greater area and substantially lesser area, the plate segments of the coils being interlaced together along the lengths thereof to form a pair of linear arrays which extend along said central longitudinal axis and are positioned on opposite sides of said axis, each of said arrays including plates of greater area from one of said coils and the plates of lesser area from the other of said coils.

4,812,708

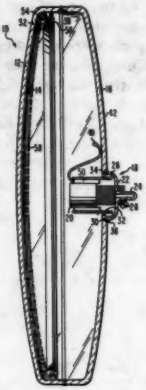
THIN CATHODE-RAY TUBE

Kern K. N. Chang, Princeton, N.J., assignor to RCA Licensing Corp., Princeton, N.J.

Filed Jan. 29, 1985, Ser. No. 695,885
Int. Cl.[4] H01J *29/00*
U.S. Cl. 313—477 R **7 Claims**

1. In a cathode-ray tube having a faceplate panel sealed to a back section thereof, said back section supporting a mount including an electron gun adapted to emit a beam of electrons for striking a cathodoluminescent screen disposed on said panel, the improvement comprising

said back section having a surface boundary substantially symmetrical in shape to that of said faceplate panel, said electron gun being disposed within that portion of said



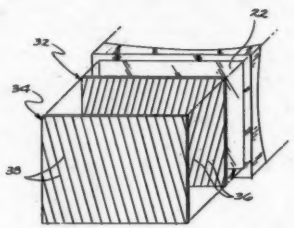
surface boundary which is symmetrical to said faceplate panel.

4,812,709

PRIVACY SCREEN FOR A COLOR CATHODE RAY DISPLAY TUBE

Edward M. Dudasik, Canoga Park, Calif., assignor to Transaction Technology Inc., Santa Monica, Calif.

Filed May 29, 1987, Ser. No. 55,735
Int. Cl.[4] H01J *31/00*
U.S. Cl. 313—478 **4 Claims**



1. A privacy screen for a color CRT tube to shield images displayed on the color CRT tube film from observers to the sides of an observer in front of the tube, including

a first light control film containing a plurality of closely spaced louvers located in front of the color CRT tube and with the louvers positioned at a tilt angle relative to a vertical line and at a first direction relative to the vertical line,

a second light control film containing a plurality of closely spaced louvers located in front of the CRT tube and the first light control film and with the louvers of the second film positioned at a tilt angle relative to the vertical line and at a second direction relative to the vertical line and opposite to the first direction of the louvers of the first film,

the tilt angles of the louvers of the first and second films providing a substantial reduction of any visual moire patterns produced by an interaction between the images on the color CRT tube and the first and second light control films while providing privacy for the images on the color CRT tube, and

the tilt angles for the louvers of the first and second films are equal and opposite relative to the vertical line and with the angle between the louvers of the first and second films less than 50°.

4,812,710
HALOGEN INCANDESCENT LAMP WITH HIGH RELIABILITY FILAMENT CONNECTION, AND METHOD OF MANUFACTURE

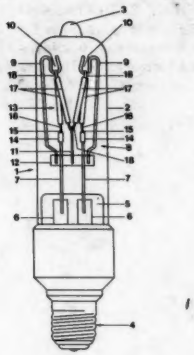
Rüdiger Klam, Eichstätt; Rupert Mühlberger, Ingolstadt, and Karl Stadler, Adelschlag, all of Fed. Rep. of Germany, assignors to Patent Treuhand Gesellschaft fur elektrische Gluhlampen mbH, Munich, Fed. Rep. of Germany

Filed Mar. 11, 1987, Ser. No. 24,708

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1986, 3609908

Int. Cl.[4] H01K *1/50, 1/18*

U.S. Cl. 313—579 11 Claims



1. Halogen incandescent lamp (1, 1') having
a bulb (2, 2');
a coiled-coil filament (13, 13'),
said coiled-coil filament having a smaller diameter primary coiling and a secondary coiling of a diameter larger than said primary coiling,
said coiled-coil filament being located in the bulb;
a filament mount (8, 8') including at least two internal current supply leads (7, 7'), of tungsten wire material to facilitate operation of the lamp in a halogen cycle,
said filament mount having end portions (15) secured to end portions of the filament; and
a pinch or press seal (5) including at least two foil elements (6) sealed therein, closing off the bulb or envelope and electrically and mechanically securing the current supply leads therein,
wherein the filament is separated into a plurality of coiled-coil portions including two coiled-coil end portions;
said internal current supply leads each having a diameter slightly less than the inner diameter of the secondary coiling of the end portions of the filament (13, 13');
the end portions of the internal current supply leads (7, 7') are formed with flattened, plate-like surfaces (19, 19') positioned inwardly of the terminal ends of said end portions,
said flattened, plate-like surfaces having a lateral dimension slightly greater than the inner coil diameter of the secondary coiling of said end portions of the filament (13, 13'), and having a thickness less than the thickness of the remainder of the current supply leads; and
wherein the coiled-coil end portions of the filament (13, 13') surround the end portions of the internal current supply leads from about the terminal ends thereof, extend, under tension, over said flattened, plate-like surfaces (19, 19') and over an adjacent portion of internal current supply leads (7, 7'),
so that, upon tensioning of the filament, the inner diameter of the secondary coiling decreases, thus holding the filament against the flattened plate-like surfaces, due to a self-clamping or self-tensioning effect of the tensioned coiled-coil filament.

4,812,711
CORONA DISCHARGE AIR TRANSPORTING ARRANGEMENT

Vilmos Török, Lidingö, and Andrzej Loreth, Akersberga, both of Sweden, assignors to Astra-Vent AB, Stockholm, Sweden

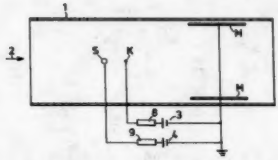
PCT No. PCT/SE85/00538, § 371 Date Jan. 13, 1987, § 102(e) Date Jan. 13, 1987, PCT Pub. No. WO86/07500, PCT Pub. Date Dec. 18, 1986

PCT Filed Dec. 20, 1985, Ser. No. 31,010

Claims priority, application PCT Int'l Appl., Jun. 6, 1985, PCT/SE85/00236

Int. Cl.[4] H01J *7/24;* H01T *23/00*

U.S. Cl. 315—111.91 29 Claims



1. An apparatus for transporting air with the aid of an electric ion-wind, comprising at least one corona electrode and at least one target electrode which is permeable to an airflow through the apparatus and which is located at a distance from and downstream of the corona electrode, as seen in the direction of said airflow; a d.c. voltage source having one terminal thereof connected to the corona electrode and the other terminal thereof connected to the target electrode, the construction of the corona electrode and the voltage between the terminals of the voltage source being such that a corona discharge generating air ions occurs at the corona electrode; and screening means for screening the corona electrode in a direction upstream of said corona electrode, such that the product of the value of any ion current in said upstream direction and the distance migrated by said any ion current from the corona electrode is practically zero, or in all events much smaller than the product of the value and the migration distance of the ion current in a direction downstream from the corona electrode to the target electrode; and the distance between the corona electrode and the part of the target electrode receiving the predominant part of said downstream ion current being at least 50 mm.

4,812,712
PLASMA PROCESSING APPARATUS

Youichi Ohnishi, Higashiosaka; Akira Okuda, Sakai; Hiromi Shima, Hirakata, and Shinichi Mizuguchi, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 9, 1986, Ser. No. 861,305

Claims priority, application Japan, May 9, 1985, 60-98366; May 9, 1985, 60-98368; Sep. 20, 1985, 60-209183; Dec. 20, 1985, 60-288566

Int. Cl.[4] C23C *15/00*

U.S. Cl. 315—176 10 Claims

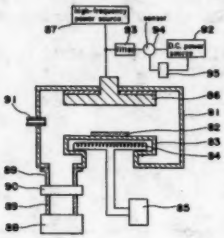
1. A plasma processing apparatus comprising:
a vacuum container which is capable of maintaining a vacuum therein;
a vacuum exhaust means connected to said container for producing a vacuum in the interior of said container;
a pressure control means operatively associated with said vacuum exhaust means for maintaining the vacuum within the vacuum container at a predetermined value;
a gas supply means connected to said container for introduc-

ing a gas into the container for carrying out a plasma-using process on an object;

an object holding means in said container for holding the object;

heating means in said container for heating the object held on the object holding means;

an electrode within said container in spaced opposed relationship to the object holding means for generating a low-temperature plasma between said electrode and said object holding means;



a high frequency power supply connected to said electrode for supplying high frequency power to said electrode;

a high frequency power blocking means connected to the connection between said high frequency power supply and said electrode; and

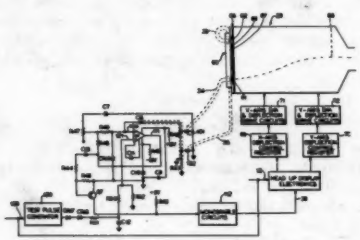
a DC power supply connected to said high frequency power blocking means for supplying a negative DC voltage to said electrode through said high frequency power blocking means simultaneously with the high frequency power.

4,812,713

AUTOMATIC CLOSED LOOP SCALING AND DRIFT CORRECTING SYSTEM AND METHOD

Clark E. Blanchard, 1396 Mapleview SE., Kentwood, Mich. 49508

Filed May 1, 1986, Ser. No. 858,414
Int. Cl.[4] H01J *29/56*; H04N *9/24*
U.S. Cl. 315—370 **31 Claims**



1. In a method for automatically maintaining a desired geometrical relationship between beam deflection commands and the location of a resultant image display on a beam activated display screen, said method comprising:

establishing reference beam deflection command values for representing respective beam position sensing locations within the range of deflection of the beam,

supplying beam deflection commands causing the beam to trace a resultant image display, and while maintaining said image display also causing scanning of the beam in at least both X and Y directions in a search pattern about the respective beam position sensing locations to determine actual beam deflection and,

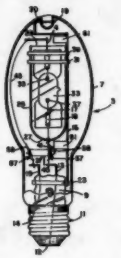
thereafter modifying the commands in accordance with the so determined actual beam deflection so as to tend to maintain the desired geometrical relationship of the resultant image display.

4,812,714

ARC DISCHARGE LAMP WITH ELECTRODELESS ULTRAVIOLET RADIATION STARTING SOURCE

William M. Keeffe, Rockport; John F. Waymouth, Marblehead, and Gregory Zaslavsky, Brookline, all of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Oct. 22, 1987, Ser. No. 111,396
Int. Cl.[4] H01J *7/44*
U.S. Cl. 315—60 **9 Claims**



1. A metal halide arc discharge lamp comprising:

an arc tube containing a chemical fill including mercury and metal halides and having first and second electrodes respectively sealed at opposite ends thereof;

an outer envelope surrounding said arc tube and having first and second terminals for electrical connection thereto;

means for electrically coupling said first electrode of said arc tube to said first terminal;

means for electrically coupling said second electrode of said arc tube to said second terminal; and

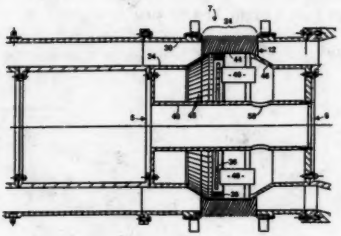
an electrodeless source of ultraviolet radiation within said outer envelope proximate said arc tube for producing radiation which illuminates the path between said electrodes of said arc tube to decrease the amount of time for generating a gaseous discharge therebetween, said source of ultraviolet radiation comprising an envelope of ultraviolet light transmitting material having opposing ends, a fill material contained within said envelope of said source of ultraviolet radiation, first contact means capacitively coupling the external surface of one of said opposing ends of said envelope of said source of ultraviolet radiation to said means for electrically coupling said first electrode of said arc tube to said first terminal, second contact means capacitively coupling the external surface of the other of said opposing ends of said envelope of said source of ultraviolet radiation to said means for electrically coupling said second electrode of said arc tube to said second terminal such that said source of ultraviolet radiation produces said ultraviolet radiation during lamp starting when said first and second terminals of said lamp are energized wherein said first and second contact means each comprise a wire helically wrapped around said external surface of a respective opposing end or a mesh sleeve of a conductive material.

4,812,715

CURRENT-LEVEL TRIGGERED PLASMA-OPENING SWITCH

Clifford W. Mendel, Albuquerque, N. Mex., assignor to The United States Department of Energy, Washington, D.C.

Filed Jun. 29, 1987, Ser. No. 67,027
Int. Cl.[4] H01J *17/00, 1/50;* **H05B** *37/00*
U.S. Cl. 315—340 **10 Claims**



1. A current-level-triggered plasma-opening switch for connecting a very high current, high voltage, power supply for generating current pulses at an input end to a load at an output end, said switch comprising:

a coaxial transmission line consisting of:

a first metal electrode; and

a second metal electrode coaxial with and spaced by a gap from said first electrode, wherein current from said source flows into one electrode and out of the other electrode; said transmission line having a switch portion located between said ends, said switch portion including:

slow coil means coaxial with said transmission line for generating a slow magnetic field extending across said gap in said switch portion between said electrodes, said first metal electrode including means for preventing the penetration of said slow magnetic field into said electrode during the operation of the slow coil means, and

means for generating a plasma in said gap in the location of said slow magnetic field; whereby

said plasma is confined by said slow magnetic field between, and provides an electrically conductive path between, said electrodes, thereby shunting the current across the gap; and

said slow magnetic field and said conductive plasma are forced from said first electrode when the self-magnetic field generated by current flow exceeds said slow magnetic field, thereby opening the switch.

4,812,716

ELECTRON BEAM SCANNING DISPLAY APPARATUS WITH CATHODE VIBRATION SUPPRESSION

Hiroshi Miyama, Yokohama; Yoshikazu Kawauchi, Kawasaki; Kaoru Tomii, Isehara, and Jun Nishida, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 2, 1986, Ser. No. 847,311
Claims priority, application Japan, Apr. 3, 1985, 60-70276; Apr. 3, 1985, 60-70277; Apr. 18, 1985, 60-82825; Apr. 18, 1985, 60-82826; May 20, 1985, 60-107350; May 21, 1985, 60-108817
Int. Cl.[4] H01J *29/70, 29/72*
U.S. Cl. 315—366 **31 Claims**

3. An electron beam scanning display apparatus comprising:

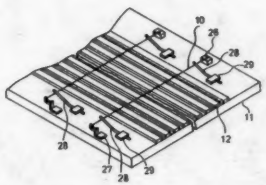
a plurality of line cathode holders;

a plurality of line cathodes, each stretched between a pair of said holders;

a plurality of scanning electrodes which are insulated from each other and disposed substantially perpendicular to a direction of said line cathodes, a space formed between said scanning electrodes and said line cathodes, said scanning electrodes for producing electron beams by application of predetermined potentials thereon;

a face plate disposed facing said plurality of line cathodes with a certain distance therebetween and having a display screen on an inner face thereof;

deflection electrodes disposed between said line cathodes and said face plate for deflecting at least part of said electron beams; and



vibration suppressing means for suppressing vibration of said line cathodes, wherein

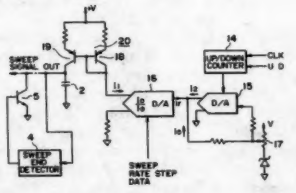
said vibration suppressing means comprises at least one wire-shaped damper means, having a free end part touching one of said line cathodes, and another end thereof which is fixed.

4,812,717

SWEEP CIRCUIT FOR OSCILLOSCOPE

Hiroshi Ichijyo, Kawasaki, Japan, assignor to Kabushiki Kaisha Kenwood, Japan

Filed Apr. 29, 1987, Ser. No. 43,751
Claims priority, application Japan, May 7, 1986, 61-103156
Int. Cl.[4] H01J *29/70, 29/72*
U.S. Cl. 315—367 **10 Claims**



1. An oscilloscope sweep circuit comprising:

means (e.g., **13, 14, 15**) for producing a first reference signal which is a function of fine step digital data applied thereto;

means (e.g., **12, 16, 20**) for producing a second reference signal which is a function of said first reference signal and sweep rate step digital data applied thereto; and

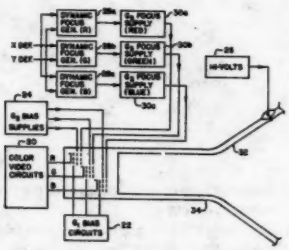
means (e.g., **2, 4, 5**) responsive to said second reference signal for generating a sweep signal the sweep rate of which is determined by said second reference signal

whereby said sweep rate step digital data corresponds to a coarse setting of the sweep rate, and said fine step digital data correspond to a fine setting of the sweep rate.

4,812,718
RESOLUTION DELTA GUN COLOR MONITOR SYSTEM APPARATUS

Lawrence A. Nix, Jr., Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 14, 1987, Ser. No. 132,497
Int. Cl.[4] H01T 29/58
U.S. Cl. 315—382 **6 Claims**



1. A high resolution delta gun color monitor apparatus comprising in combination:

a delta gun cathode ray tue having a first, second and third electron gun and an anode, each electron gun of said first, second and third electron guns comprising:

a cathode to receive a color video signal,

a first grid, G_1 aligned with said cathode to receive a first bias signal,

a second grid, G_2 aligned with said first grid G_1 to receive a second bias signal, and

a third grid G_3 aligned with said second grid G_2,

a deflection control unit to receive X and Y deflection signals, said deflection control unit providing focus signals, said deflection control unit comprising a first, second and third dynamic focus generator/focus supply unit, said first dynamic focus generator/focus supply unit operatively connected to said first electron gun, said second dynamic focus generator/focus supply unit operatively connected to said second electron gun, and said third dynamic focus generator/focus supply unit operatively connected to said third electron gun.

4,812,719
HIGH VOLTAGE REGULATOR IN A TELEVISION APPARATUS

Joseph C. Stephens; Lawrence E. Smith, and Michael E. Boyer, all of Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Apr. 20, 1988, Ser. No. 183,950
Int. Cl.[4] H01J 29/70
U.S. Cl. 315—411 **12 Claims**

1. A power supply of a television apparatus, comprising:

a source of a synchronizing input signal at a frequency that is related to a deflection frequency;

a deflection circuit output stage responsive to said input signal, including a flyback transformer, for generating in a first winding of said transformer a first voltage having a retrace portion during a retrace interval and a trace portion during a trace interval in each period of said first voltage;

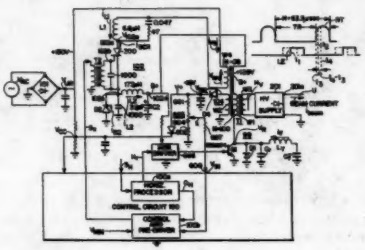
a high voltage power supply stage coupled to said flyback transformer for generating a high voltage that is applied to a first load to produce a load current therein;

a first inductance separate from said flyback transformer for conducting therethrough a first current having a magnitude that varies when a variation in said load current occurs;

a source of an input supply voltage;

a second inductance for conducting a second current therethrough that is coupled to a supply voltage receiving terminal of said deflection circuit output stage;

a first switch having a main current conducting electrode that is coupled to said first winding, to said first inductance and to said input supply voltage and a control terminal that is responsive to said input signal, said first switch applying said input supply voltage to said first inductance and to said second inductance during a portion of said trace interval to generate said first and second currents, said first current in said first inductance developing a voltage that is applied by said first switch to said first winding as long as said first switch is conductive, thereby



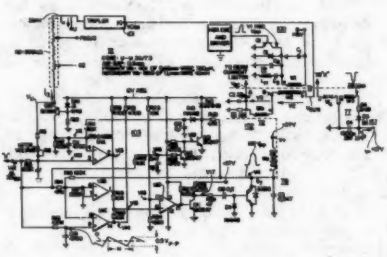
defining a first portion of said retrace interval that varies in accordance with said magnitude of said first current for providing high voltage compensation, said first switch becoming nonconductive during said retrace interval for decoupling said first inductance from said first winding; and

a second switch coupled to said second inductance for providing through said second switch a current path for said second current in said second inductance that bypasses said first switch to prevent coupling of said second current to said first winding via said first switch during at least a part of said first portion of said retrace interval.

4,812,720
HIGH VOLTAGE STABILIZATION CIRCUIT FOR VIDEO DISPLAY APPARATUS

Peter E. Haferl, Adliswil, Switzerland, assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Jun. 6, 1988, Ser. No. 202,359
Claims priority, application United Kingdom, Oct. 23, 1987, 8724891
Int. Cl.[4] H01J 29/70
U.S. Cl. 315—411 **17 Claims**



1. A high voltage power supply of a video apparatus, comprising:

a source of an input signal at a frequency that is related to a deflection frequency;

a first flyback resonant circuit;

first switching means responsive to said input signal and coupled to said first flyback resonant circuit for generating a periodic, resonant first flyback voltage that is developed across a high voltage winding of a flyback transformer;

a second flyback resonant circuit;

second switching means responsive to a control signal and coupled to said second flyback resonant circuit for generating at a first terminal of said high voltage winding a periodic, resonant second flyback voltage at a controllable phase relative to said first flyback voltage that is applied in series with said first flyback voltage such that a high voltage pulse is developed at a second terminal of said high voltage winding having an amplitude that varies in accordance with said phase; and

a control circuit for generating said control signal to vary the phase of said second flyback voltage relative to that of said first flyback voltage.

4,812,721

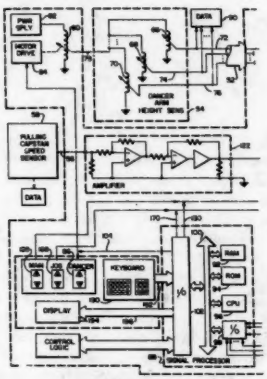
WIRE DRAWING CONTROL APPARATUS

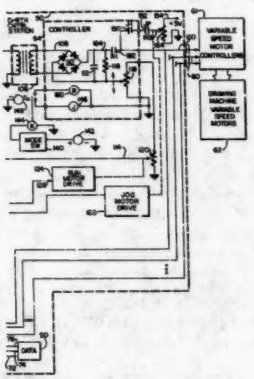
Randall C. Graham, Nashville; James D. Smith, Jr., Fairview, and Jeffrey S. Smith, Franklin, all of Tenn., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Sep. 25, 1987, Ser. No. 101,230

Int. Cl.[4] H02P *5/46*; B21C *1/12*

U.S. Cl. 318—66 **1 Claim**





1. Apparatus, for controlling the speeds of a plurality of variable speed motors according to the magnitudes of a motor drive speed control signal, a reference signal and an operator input gauge size signal, for drawing a plurality of wires to a gauge size indicated by the gauge size signal, the apparatus for controlling the motors in a corresponding plurality of fabrication lines, having an accumulator including a corresponding plurality of wire accumulator channels for accumulating wire from the motors and having an independently driven capstan for pulling the drawn wires from the accumulator, the apparatus further comprising:

a plurality of sensors, responsive to the reference signal and to the quantity of wire accumulated in each accumulator channel for providing a corresponding plurality of accumulation signals each having a magnitude equal to the reference signal magnitude augmented by a signal magnitude indicative of the quantity of wire accumulated in a corresponding channel;

a sensor, responsive to the speed of the pulling capstan for providing a capstan speed signal having a magnitude indicative of the speed of the pulling capstan for commanding the speed of the motors; and

an operator control station, comprising:

a plurality of controllers, each responsive to a selected one of said accumulation signals and to said capstan speed signal for providing a motor drive speed control signal for commanding the speed of a corresponding one of the variable speed motors according to the magnitude of said capstan speed signal modified by said selected accumulation signal so as to increase the speed of said motor to a speed greater than that indicated by the magnitude of said capstan speed signal in response to an accumulation signal magnitude indicative of an accumulation of wire less than a selected amount and modified so as to decrease the speed of said motor to a speed lesser then that indicated by the magnitude of said capstan speed signal in response to an accumulation signal magnitude indicative of an accumulation of wire greater than a selected amount;

a keyboard for entering a gauge size and for providing said gauge size signal;

a display responsive to the gauge size signal for displaying the magnitude thereof; and

signal processor means, responsive to the gauge size signal for controlling the amount of accumulation of wire in the accumulator channels by controlling the magnitude of the reference signal.

4,812,722

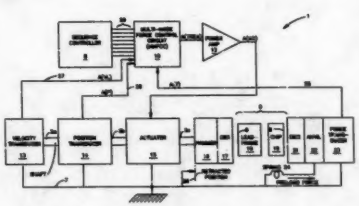
MULTI-MODE FORCE CONTROL CIRCUIT

Robert S. Corrothers, Orange County, Calif., assignor to Cams, Inc., Buena Park, Calif.

Filed Oct. 26, 1987, Ser. No. 112,540

Int. Cl.[4] B23K *20/00*; G05B *19/00*

U.S. Cl. 318—561 **15 Claims**



1. A multi-mode force control apparatus responsive to a start signal from a sequence controller to initiate a machine sequence to apply a predetermined time dependent force to a workpiece having a variable compliance via a hammer driving a first die, said workpiece being interposed between said first die and a second die, said second die being supported by an anvil referenced to a frame, the force being applied by an actuator referenced to said frame, said actuator having a power amplifier, said actuator power amplifier being responsive to an input control signal, said actuator being characterized to provide a position transducer signal and a velocity transducer signal, said multi-mode force control apparatus comprising:

a force transducer for providing a force signal corresponding to the force applied to the workpiece by said actuator via said first die;

a multi-mode force control circuit being characterized to receive:

said position transducer signal,

said velocity transducer signal,

said force transducer force signal,

said multi-mode force control circuit having:

a position mode sequence means for providing a composite position command signal characterizing a predetermined time dependent position of said hammer;

a position servo amplifier responsive to said composite position command signal for providing said input control signal to said power amplifier to move said hammer from a retracted position, to position said first die at high velocity to a predetermined first position close to said workpiece and then to position said first die at a low velocity into contact with said workpiece,

said multi-mode force control circuit being further characterized for gradually increasing the amplitude of said input control signal to said power amplifier in accordance with an increasing predetermined force reference command signal representing said predetermined time dependent force, said force signal rising to a value of voltage representing a predetermined ultimate force value, a force hold mode timing means responsive to said force signal exceeding said ultimate force value for providing a force hold mode time interval;

a force rise mode sequence means being responsive to said first die making contact with said workpiece for operation during a force rise mode sequence and said force hold mode time interval for interrupting further increase in said force reference command signal in response to variations in said workpiece compliance to substantially prevent the force applied to said workpiece from exceeding said predetermined time dependent force;

a retract mode sequence means responsive to termination of said force hold mode time interval for returning said hammer to said retracted position.

4,812,723

MOTOR-OPERATED BRAKE SYSTEM

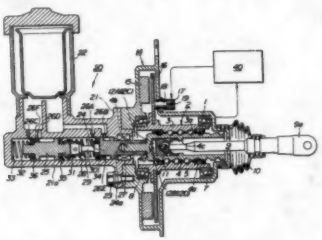
Yasuo Shimizu, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 7, 1987, Ser. No. 70,933

Claims priority, application Japan, Jul. 7, 1986, 61-159303

Int. Cl.[4] B60T *13/66;* F15B *9/14*

U.S. Cl. 318—488 **3 Claims**



1. A motor-operated brake system comprising:

an input rod coupled to a brake pedal and displaceable with an axial thrust force commensurate with the depressing force on the brake pedal;

cylinder means having at least one piston operable by the thrust force applied to said input rod for producing hydraulic pressure;

hydraulic pressure transmitting means for transmitting the hydraulic pressure generated by said cylinder means to braking mechanism associated respectively with wheels;

servo means including an electric motor for producing rotational motion and a converting mechanism for converting the rotational motion from said electric motor to linear motion and transmitting the linear motion to said piston of the cylinder means, said servo means being arranged to apply an amplified force to said piston of the cylinder means, said electric motor having a disc-shaped rotor disposed substantially perpendicular to the axis of said input rod;

thrust detecting means for detecting the magnitude of the thrust force applied to said input rod; and

control means responsive to a signal from said thrust detecting means for generating a motor control signal to control operation of said electric motor.

4,812,724

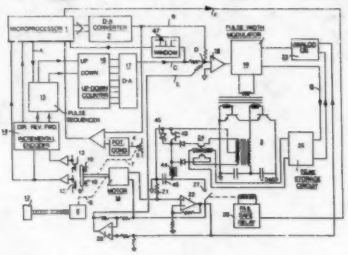
INJECTOR CONTROL

Alois A. Langer, Forest Hills, and Albert W. Rinne, Bethel Park, both of Pa., assignors to Liebel-Flarsheim Corporation, Cincinnati, Ohio

Filed Nov. 13, 1984, Ser. No. 670,525

Int. Cl.[4] G05B *11/28*

U.S. Cl. 318—599 **6 Claims**



1. An injector having a piston and a motor for positioning said piston; said injector also having a flow command signal producing means for producing a flow command signal, a motor control means, and a first pulse producing means for producing a first pulse train of frequency proportional to said flow command signal;

said motor control means being connected to said flow command signal producing means and to said motor for receiving said flow command signal and driving said motor at a rate proportional to the flow rate commanded by said flow command signal, said motor when so driven providing a motor rate feedback signal corresponding to the actual rate at which it is being driven by said motor control means, to position said piston;

said injector also having a second pulse producing means operated by said motor for producing a second pulse train having a frequency proportional to the actual rate at which said motor is positioning said piston, and an integrating means responsive to both said pulse trains for integrating the difference between the frequencies of said pulse trains and thereby producing a rate correction signal;

said rate correction signal, said flow command signal and said motor rate feedback signal being applied to said motor control means such as to cause said motor to position said piston accurately.

4,812,725

POSITIONING DEVICE WITH DUAL LINEAR MOTOR

Anwar Chitayat, Duck Island, P.O. Box 107, Northport, N.Y. 11768

Filed Oct. 16, 1987, Ser. No. 109,086

Int. Cl.[4] H02P *5/46;* B66C *19/00*

U.S. Cl. 318—625 **1 Claim**

1. A positioning device comprising:

first and second spaced-apart linear motors movable parallel to each other along an X axis;

a Y-axis assembly bridging said first and second spaced-apart linear motors;

said Y-axis assembly including a workpiece support;

means for moving said workpiece support to selectable positions along a y axis normal to said X axis;

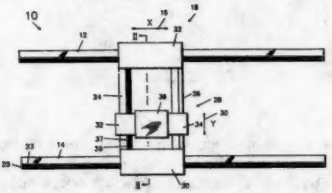
means for producing a first control signal responsive to a position of said workpiece support along said Y axis;

control signal means for producing a motor control signal;

proportioning means responsive to said first control signal for proportioning said motor control signal between said first and second linear motors;

said proportioning means including means for producing first and second signals for feeding to said first and second linear motors respectively;

said first linear motor including feedback means for producing a feedback signal indicating one of a position and a velocity;



said control signal means being responsive to said feedback signal to vary said motor control signal in response thereto, whereby said first linear motor is driven under closed-loop control and said second linear motor is driven under open-loop control in response to a closed-loop control signal produced in response to said feedback signal from said first linear motor.

4,812,726

SERVO CIRCUIT POSITIONING ACTUATOR

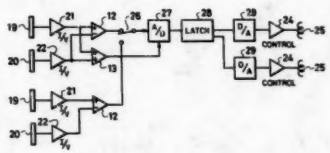
Toshihiko Benii, and Kyosuke Yoshimoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 16, 1987, Ser. No. 3,798

Claims priority, application Japan, Jan. 16, 1986, 61-8265; Jan. 28, 1986, 61-18451

Int. Cl.[4] G05B *1/06*

U.S. Cl. 318—640 **5 Claims**



1. A servo circuit comprising:

positioning actuator means for moving an object in response to a servo signal;

detector means, having a plurality of outputs, for varying a first set of said outputs in accordance with the position of the object;

signal processing means for receiving said outputs of said detector means, for digitally processing said first set of outputs such that a sum of said first set of outputs normalizes a difference of said first set of outputs and for providing the servo signal varying in accordance with said processing of said first set of outputs, said signal processing means including

A/D conversion means for converting an analog input to digital form in accordance with said sum of said first set of outputs and for providing, as a digital output, the digital form of said analog input, a digital form of said difference of said first set of outputs corresponding to said servo signal, and

means for providing said difference of said first set of outputs to said analog input; and

additional positioning actuator means for moving an additional object in response to an additional servo signal, and wherein

said detector means comprises means for varying a second set of said plurality of outputs in accordance with the position of said additional object, and wherein

said means for providing comprises time division switching means for selectively providing said difference of said first set of outputs and a difference of said second set of outputs to said analog input of said A/D conversion means, such that a digital form of said differences of said second set of outputs corresponds to said additional servo signal.

4,812,727

STEPPING MOTOR DRIVE DEVICE

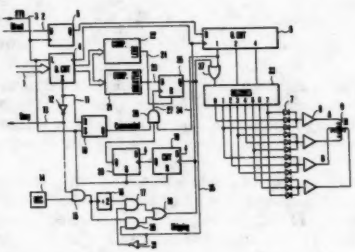
Shinji Sakai; Takashi Kawabata, and Ryosuke Miyamoto, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 850,975, Apr. 11, 1986, abandoned. This application Oct. 9, 1987, Ser. No. 107,877

Claims priority, application Japan, Apr. 16, 1985, 60-080492

Int. Cl.[4] H02I *8/00*

U.S. Cl. 318—696 **23 Claims**



1. A drive apparatus for a stepping motor for a camera system, comprising:

(a) comparing means for comparing a number of steps to be driven with a prescribed value; and

(b) switchover means for switching a phase excitation mode of said stepping motor based on the comparision result of said comparing means after starting driving said stepping motor in a 1-2 phase excitation mode;

wherein said switchover means switches over said stepping motor between a 1–2 phase excitation mode and a 2-phase excitation mode, so that said switchover means switches to the 2-phase excitation mode when the number of steps to be driven is larger than the prescribed value, and maintains the 1–2 phase excitation mode when the number of steps to be driven is smaller than the prescribed value.

4,812,728

ELECTRO MAGNETIC BRAKING CIRCUIT FOR SMALL SINGLE PHASE INDUCTION MOTORS

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan, R.O.C., Taiwan

Filed Dec. 16, 1987, Ser. No. 133,740

Int. Cl.[4] H02P *1/44*

U.S. Cl. 318—760 **2 Claims**

1. A capacitive braking circuit for a single phase induction motor, said motor having a rotor, a starting winding and a running winding, said braking circuit comprising:

a single-pole, double-throw centrifugal switch having a common contact, a normally-closed contact and a normally-open contact;

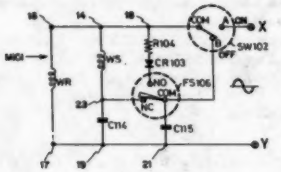
said centrifugal switch being driven by said rotor, said com-

mon contact and said normally-closed contact of said centrifugal switch being in engagement when said rotor is substantially at rest, said common contact and said normally-open contact of said centrifugal switch being in engagement when said rotor is substantially at operating speed;

a single-pole, double throw power switch having first, second and common contacts, said first contact being connected to a first line of a two line source of AC power for said motor, said common contact of said power switch being connected to said common contact of said centrifugal switch; one end each of said running winding and said starting winding being connected to a second line of said power source;

the end of said running winding opposite said one end thereof being connected to said common contact of said power switch;

the end of said starting winding opposite said one end thereof being connected to said normally closed contact of said centrifugal switch;



a braking capacitor having first and second terminals, said first terminal thereof being connected to said second line of said power source, said second terminal thereof being connected to said second contact of said power switch; and

a charging circuit for said braking capacitor, said charging circuit including a rectifier and a resistor connected in series, said charging circuit being connected between said normally open contact of said centrifugal switch and said second contact of said power switch; whereby, when said rotor is at rest said braking capacitor is disconnected from said charging circuit and when said rotor reaches operating speed, said braking capacitor is connected to said charging circuit to receive charging current and when said common and second contacts of said power switch are engaged, said running winding is disconnected from said power source and is connected to said braking capacitor to receive discharge current therethrough and provide braking action.

4,812,729

PROTECTING APPARATUS FOR SECONDARY EXCITATION TYPE VARIABLE SPEED AC GENERATOR/MOTOR

Akio Ito; Hidenori Sawa, both of Hitachi; Hiroshi Sugisaka, Takahagi; Shigeaki Hayashi, Suita; Hiroto Nakagawa, Osaka; Yasuteru Oono, Kobe, and Eiji Haraguchi, Ibaraki, all of Japan, assignors to Hitachi Ltd. and The Kansai Electric, Tokyo, Japan

Filed Aug. 13, 1987, Ser. No. 84,805

Claims priority, application Japan, Aug. 19, 1986, 61-193693; Dec. 1, 1986, 61-286283

Int. Cl.[4] H02P *5/40*

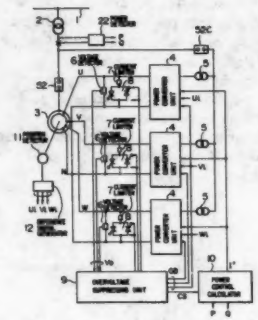
U.S. Cl. 318—732 **17 Claims**

1. A protecting apparatus for a secondary excitation type variable speed AC generator/motor having a primary winding connected to an electric power system and a secondary winding each phase of which is AC excited by an independent power converter unit, said protecting apparatus comprising:

means for detecting an electrical event which includes at least one of overvoltge and overcurrent appearing at any phase of the secondary winding of said AC generator/motor;

a switch circuit connected in each phase of the secondary winding of said AC generator/motor;

means for deciding whether said detected electrical event meets a predetermined condition; and



means for closing, when said electrical event detected in any phase of the secondary winding is decided as meeting said predetermined condition, said switch circuit connected in the corresponding phase of the secondary winding.

4,812,730

VARIABLE-SPEED GENERATOR/MOTOR SYSTEM

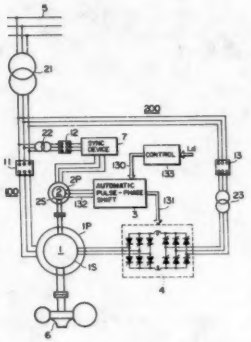
Hiroto Nakagawa, Osaka; Yasuteru Oono, Minoo; Tadaatsu Kato, Takarazuka; Osamu Nagura, Katsuta; Sadahiko Niwa, Hitachi; Yosio Furukawa, Hitachi, and Shigehiro Kayukawa, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo and Kansai Electric Power Co., Inc., Osaka, both of, Japan

Filed Apr. 6, 1987, Ser. No. 35,035

Claims priority, application Japan, Apr. 7, 1986, 61-78125

Int. Cl.[4] H02P *5/40*

U.S. Cl. 318—732 **8 Claims**



1. A variable-speed generator/motor system, comprising a generator/motor including a primary winding and a secondary winding, the secondary winding being installed on a motor that is coupled to a prime mover/load, a main circuit interposed between a power system having a power system frequency and the primary winding of the generator/motor, an excitation circuit including a frequency converter inserted between a part of the main circuit and the secondary winding of the generator/motor, frequency difference detector means having input means for receiving the power system frequency and a frequency dependent on the rotational speed of the prime mover/load for determining the difference between the frequency

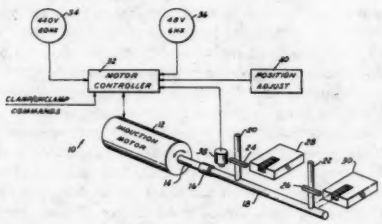
of the power system and the frequency dependent on the rotational speed of the prime mover/load a phase-shift control device for controlling the firing phase of the frequency converter in the excitation circuit, and a sync device means connected to the power system to receive as an input the power system frequency for producing a sync frequency signal following the frequency of the power system under normal operation and for outputting the sync frequency signal to the frequency difference detector means as the power system frequency input such that in the case of a disturbance of the power system, the same frequency signal of the power system as before the disturbance is produced continuously by the sync device means and is input to the frequency difference detector means.

4,812,731

CLAMP ACTUATED BY INDUCTION MOTOR

Rodger T. Lovrenich, 209 Whispering Sands, Santa Teresa, N. Mex. 88008

Filed Oct. 15, 1986, Ser. No. 918,899
Int. Cl.[4] A02P 5/40
U.S. Cl. 318—800 **5 Claims**



1. An induction motor system for driving a load comprising

an induction motor having an electrical power input and an output for driving a load toward an abutment position, said motor having a predetermined design drive frequency and voltage for obtaining full load current at rated torque and having an inherent slip frequency at rated torque,

first power supply means having an output frequency and voltage equal to said design drive frequency and voltage,

second power supply means having an output frequency equal to said slip frequency and an output voltage coordinated with said slip frequency and with rated torque of said motor to deliver full load current at rated torque,

sensor means for determining load position, and

control means for selectively alternatively connecting said first and second power supply means to said motor power input, said control means being responsive to said sensor means for connecting said first power supply means to said motor input to drive said load toward said abutment position, and for connecting said second power supply means to said motor input for obtaining rated torque at full load current to hold the load in said abutment position.

4,812,732

CONTROL DEVICE FOR AN A. C. GENERATOR FOR AN AUTOMOBILE

Shiro Iwatani, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

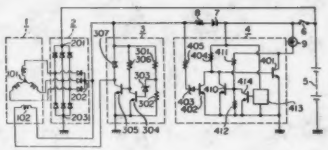
Filed Nov. 5, 1987, Ser. No. 116,914
Claims priority, application Japan, Nov. 13, 1986, 61-270715
Int. Cl.[4] H02J 7/14
U.S. Cl. 322—99 **5 Claims**

1. A control device for an a.c. generator for an automobile which comprises:

a voltage regulator for controlling a current in the field coil of said a.c. generator to control an output voltage from said generator, and

an alarm device comprising an alarm lamp;

an alarm lamp actuating transistor for actuating said alarm lamp which gives a warning of abnormality in said a.c. generator, a controlling transistor for controlling said alarm lamp actuating transistor, and



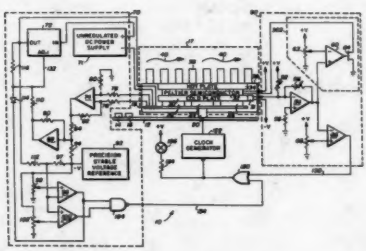
a collector potential detecting transistor which is coupled to the collector of said alarm lamp actuating transistor and which is turned on when the potential of the collector of said alarm lamp actuating transistor reaches a predetermined value or higher, to thereby turn off the same.

4,812,733

COMPUTER ELEMENT PERFORMANCE ENHANCER

Richard Tobey, 648 Sheraton Dr., Sunnyvale, Calif. 94087

Filed Oct. 27, 1987, Ser. No. 114,074
Int. Cl.[4] G05F 1/46
U.S. Cl. 323—285 **15 Claims**



1. A computer element performance enhancer for increasing the speed of a computer element comprising:

a peltier device thermally connected to a computer element for maintaining the computer element at a temperature below ambient; and

an enclosure surrounding and hermetically sealing the computer element and the peltier device, said enclosure containing a water free environment for preventing condensation from forming.

4,812,734

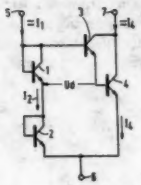
CURRENT-MIRROR ARRANGEMENT

Cord H. Kohsiek, Ellerau, Fed. Rep. of Germany, assignor to U.S. Philips Corp., New York, N.Y.

Filed Nov. 25, 1987, Ser. No. 125,262
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1986, 3642167
Int. Cl.[4] G05F 3/22
U.S. Cl. 323—312 **9 Claims**

1. A current-mirror arrangement comprising a first and a second branch connected in parallel with one another, two transistors each having a base-emitter path, wherein the first branch comprises two series-connected diodes and the second

branch comprises a series arrangement of the base-emitter paths of the two transistors and with all of the emitter current



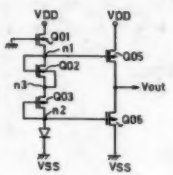
of one transistor constituting the base current of the other transistor.

4,812,735

INTERMEDIATE POTENTIAL GENERATING CIRCUIT

Kazuhiro Sawada, Yokohama, and Takayasu Sakurai, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanakawa, Japan

Filed Dec. 28, 1987, Ser. No. 138,798
Claims priority, application Japan, Jan. 14, 1987, 62-5108
Int. Cl.[4] G05F *3/30*
U.S. Cl. 323—313 7 Claims



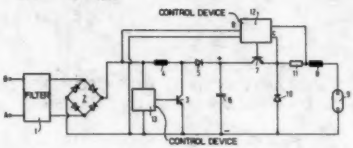
1. An intermediate potential generating circuit comprising:
a load element having a first end thereof connected to a first potential supply source,
a first transistor of a first conductivity type having a first end thereof and a gate thereof connected to a second end of said load element,
a second transistor of a second conductivity type having a first end thereof connected to a second end of said first transistor, and having a gate and a second end thereof connected together;
a third transistor of said first conductivity type having a first end thereof connected to said first potential supply source, a gate thereof connected to a node between said load element and said first transistor and a second end thereof connected to an output terminal;
a fourth transistor of said second conductivity type connected between said output terminal and a second potential supply source and having a gate thereof connected to said gate and said second end of said second transistor; and
a constant-voltage means connected between said second end of said second transistor and said second potential supply source for causing a specified voltage drop between the ends of said constant voltage means.

4,812,736

CIRCUIT ARRANGEMENT FOR OPERATING HIGH-PRESSURE GAS DISCHARGE LAMPS

Manfred Albach; Ralf Schäfer, both of Aachen; Hans-Peter Stormberg, Stolberg, and Armin Wegener, Aachen, all of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jul. 1, 1986, Ser. No. 880,855
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1985, 3524266
Int. Cl.[4] G05F *1/56*
U.S. Cl. 323—224 14 Claims



4. A circuit for operating a high pressure gas discharge lamp with a fluctuating current of high frequency comprising, a full-wave rectifier having input terminals for connection to a source of AC voltage and having direct voltage output terminals, a first circuit part including an inductor and a switching transistor serially coupled across the rectifier direct voltage output terminals, said first circuit part further comprising a fly-wheel diode and a capacitor connected in series circuit to said switching transistor, a second circuit part comprising an electronic switching element coupling the capacitor to terminals for connection of a lamp, a control device having an output coupled to a control electrode of the electronic switching element for controlling the switching of said electronic switching element, said control device having first input means coupled to an actual-value signal proportional to an instantaneous lamp current of said high frequency and second input means coupled to a nominal-value signal comprising a sinusoidal voltage of double the AC voltage frequency and a DC voltage component of at least the maximum amplitude of the sinusoidal voltage, and said control device includes means for comparing the actual-value signal and the nominal-value signal to derive a switching control signal at its output.

4,812,737

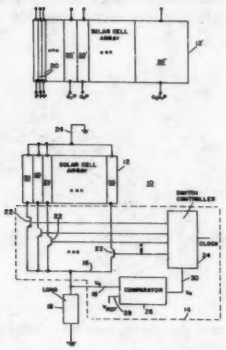
VOLTAGE REGULATOR FOR SOLAR CELL ARRAYS

Gerald W. Fleck, Long Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Jul. 10, 1987, Ser. No. 72,065
Int. Cl.[4] G05F *1/67*
U.S. Cl. 323—271 24 Claims

1. A switch controller for regulating the output of a segmented array, comprising:
means for switching a first plurality of segments of the array into and out of the output of the array, each of the first plurality of segments generating an output of a first magnitude for fine resolution control of the output; and
means for switching a second plurality of segments of the array into and out of the output of the array, each of the

second plurality of segments generating an output of a second magnitude, the second magnitude being greater



than the first magnitude for coarse resolution control of the output.

4,812,738

APPARATUS FOR ANALYZING TRANSMISSION/REFLECTION CHARACTERISTICS

Hiroshi Itaya, Isehara, and Goro Saito, Aikawamachi, both of Japan, assignors to Anritsu Corporation, Tokyo, Japan

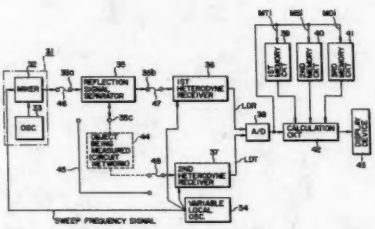
PCT No. PCT/JP86/00180, § 371 Date Dec. 1, 1986, § 102(e) Date Dec. 1, 1986, PCT Pub. No. WO86/06230, PCT Pub. Date Oct. 23, 1986

PCT Filed Apr. 11, 1986, Ser. No. 945,873

Claims priority, application Japan, Apr. 13, 1985, 60-78757

Int. Cl.[4] G01R *27/04*

U.S. Cl. 324—58 B 4 Claims



1. An apparatus for analyzing transmission/reflection characteristics of an object to be measured, comprising:

means for generating a measuring signal whose frequency sequentially varies with time;

a reflection signal separator having an input port adapted to be supplied with the measuring signal, a test port and an output port;

a through transmission path and short-circuiting and open-circuiting elements arranged to be selectively connected to the test port;

a first heterodyne receiver having a receiving terminal connected to the output port;

a second heterodyne receiver having a receiving terminal arranged to be selectively connected either to the through transmission path or to the object to be measured;

means for enabling the receiving terminal of the second heterodyne receiver to be coupled to said test port via said through transmission path when in a calibration mode, and for enabling said receiving terminal of the second heterodyne receiver to be coupled to said test port via the object to be measured when in a measurement mode;

first memory means for storing, in said calibration mode, an output signal of the second heterodyne receiver in association with the frequency of the measuring signal when the second heterodyne receiver is connected to the test port via the through transmission path;

second memory means for storing, in said calibration mode, an output signal of the first heterodyne receiver in association with the frequency of the measuring signal when the short-circuiting element is connected to the test port;

third memory means for storing, in said calibration mode, an output signal of the first heterodyne receiver in association with the frequency of the measuring signal when the open-circuiting element is connected to the test port;

an arithmetic operation device which, when the object to be measured is connected between the test port and the receiving terminal of the second heterodyne receiver, calibrates output signals of both the first and the second heterodyne receivers in accordance with the memory contents of said first to third memory means when in the measurement mode; and

means for allowing the output signals of said first and said second heterodyne receivers which have been calibrated by said arithmetic operation device to be displayed in association with the frequency of the measuring signal.

4,812,739

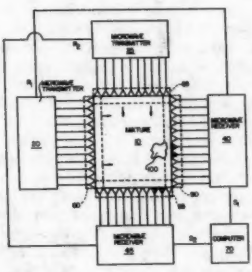
APPARATUS AND METHOD FOR USING MICROWAVE RADIATION TO MEASURE WATER CONTENT OF A FLUID

Claude V. Swanson, 1800 Old Meadow Rd., Suite 220, McLean, Va. 22102

Filed Sep. 15, 1986, Ser. No. 906,952

Int. Cl.[4] G01R *27/04*

U.S. Cl. 324—58.5 A 20 Claims



1. Apparatus for measuring a volume fraction of a first fluid having a microwave radiation energy absorption peak at a predetermined microwave peak frequency in a mixture of said first fluid and a second fluid flowing through a three dimensional conduit, said apparatus comprising:

first means, arranged on one side of a volume of said mixture, for generating a first microwave beam proximate said peak frequency, a second microwave beam below said peak frequency and a third microwave beam above said peak frequency;

second means, arranged across said volume from said first means, for receiving said first, second and third generated microwave beams after they have passed through the mixture, and for generating a first signal indicative of attenuation of said first, second and third microwave beams in said mixture; and

third means, electrically connected to said second means and responsive to said first signal, for computing said volume

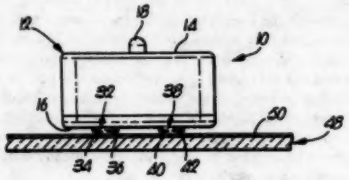
fraction of said first fluid in said mixture based on said first signal.

4,812,740

COATING DETECTOR FOR LOW EMISSIVITY GLASS

Christopher J. Shutts, 10128 Woodbury Dr., Wexford, Pa. 15090

Filed Nov. 24, 1986, Ser. No. 934,507
Int. Cl.[4] G01R 27/00
U.S. Cl. 324—62 6 Claims



1. A detector for sensing the electrical conductivity of a planar surface of a body such as glass panels and the like comprising:

a housing having outer walls with a configuration adapted to be carried by the human hand;

a battery carried by said housing and having a first power terminal and a second power terminal;

on-off indicator means supported by said housing and having a first energizing terminal and a second energizing terminal electrically connected to said second power terminal of said battery;

a first contact element having an electrically conductive outer portion electrically coupled to said first power terminal of said battery;

a second contact element having an electrically conductive outer portion electrically connected to said first energizing terminal of said indicator means;

said indicator means in combination with said battery being operable to emit a discrete user-notifying signal when said first contact element and said second contact element are in engagement with said surface of said body when the electrical conductivity of said surface exceeds a certain, predefined value; and

structure connecting said first contact element and said second contact element to one of said outer walls of said housing for supporting said outer portion of said first contact element and said outer portion of said second contact element a fixed distance away from said housing, for enabling said outer portions to directly and simultaneously engage said planar surface of said body when said housing is brought into a position adjacent said body,

said outer portion of said first contact element and said outer portion of said second contact element including rounded, generally hemispherical segments for minimizing damage due to abrasion on said planar surface of said body.

4,812,741

BALER-MOUNTED CONTINUOUS MOISTURE MONITORING SYSTEM

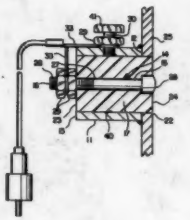
Dennis E. Stowell, P.O. Box 796, Parowan, Utah 84761

Filed Feb. 10, 1987, Ser. No. 13,130
Int. Cl.[4] G01R 27/02
U.S. Cl. 324—65 P 5 Claims

4. A method for the continuous monitoring of moisture content of hay passing through a conventional baling machine having a driver's compartment and a compression zone having flat retaining walls, said method comprising:

(a) advancing hay in the compression zone of the baler in perpendicular sliding contact across the forward extremity of a sensing device flush mounted with the interior surface of a retaining wall of the compression zone, said sensing device having an electrode surrounded by electrical insulator material,

(b) feeding a constant battery voltage in a circuit between the electrode and the metal structure of the baler, said



electrode being positive, and said metal structure being a negative ground,

(c) continuously measuring the change in electrical resistivity of said circuit, and

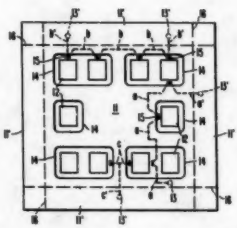
(d) causing said measured resistivity to be displayed as percent moisture in the driver's compartment.

4,812,742

INTEGRATED CIRCUIT PACKAGE HAVING A REMOVABLE TEST REGION FOR TESTING FOR SHORTS AND OPENS

Kenneth N. Abel, Vista, and John E. Rudy, Poway, both of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Dec. 3, 1987, Ser. No. 127,972
Int. Cl.[4] G01R 31/02
U.S. Cl. 324—73 R 10 Claims



1. An improved integrated circuit package, at an intermediate stage of manufacturing, of a type which includes a package body that has multiple chip attach regions for holding respective integrated circuit chips, signal pads at said chip attach regions, an array of I/O pins on said package body, a first set of conductors in said package body which selectively connect said I/O pins to some of said signal pads, and a second set of conductors in said package body which selectively connect some of said signal pads to each other but not to any of said I/O pins; wherein the improvement enhances the testability of said package and comprises:

a test region in said package body which is spaced apart and severable from said I/O pins, said chip attach regions, said signal pads, and said first and second sets of conductors;

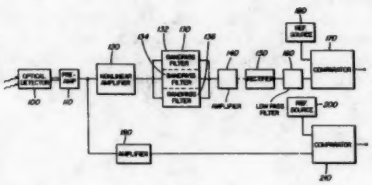
an array of test pins attached to said test region of said package body; and

a severable test set of conductors disposed in said package body which selectively connect said test pins to said signal pads such that said conductors of said first and second sets are connected in completed circuits between said I/O pins and said test pins.

4,812,743
METHOD AND APPARATUS FOR DETECTING A NARROWBAND SIGNAL

Shawn J. Morrison, Saskatoon, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jan. 13, 1988, Ser. No. 143,993
Int. Cl.[4] G01R 23/16
U.S. Cl. 324—77 R 9 Claims



5. Apparatus for discriminating between a broadband unipolar signal having a component within at least one predetermined frequency band and a narrowband signal within said at least one frequency band, the apparatus comprising:

amplifier means having a gain which decreases monotonically with increasing DC content of a signal under test appearing at an input of the amplifier means;

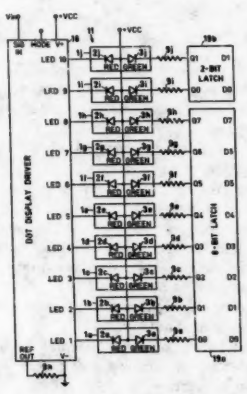
bandpass filter means responsive to an output of the amplifier means and having at least one passband corresponding to said at least one frequency band; and

comparator means having a first input responsive to an output responsive to a reference signal to apply a first signal to an output of the comparator means when the reference signal exceeds the output of the bandpass filter means and to apply a second signal different from said first signal to said output of the comparator means when the output of the bandpass filter exceeds the reference signal.

4,812,744
VARIABLE COLOR ANALOG VOLTMETER

Karel Havel, P.O. Box 66, Station M, Toronto, Ontario, Canada M6S 4T2

Filed Dec. 24, 1986, Ser. No. 946,036
Int. Cl.[4] G01R 31/00; G09G 3/20
U.S. Cl. 324—115 12 Claims



5. A measuring device comprising:

signal measuring means;

analog display means including a plurality of variable color display elements arranged in an array, each said display element including a first light source for emitting upon activation light signals of a first primary color, second light source for emitting upon activation light signals of a second primary color, and means for combining said light signals in each said display element to obtain a composite light signal of a composite color;

value control means for providing on said display means an analog indication of a measured value of the signal by selectively activating a single one of said first light sources corresponding by a position in said array to said value of the signal, for illuminating it in said first primary color;

memory means for storing data representing values of predetermined low and high limits;

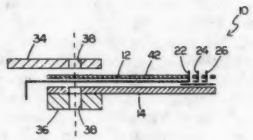
limit control means responsive to said memory means for selectively activating certain of said second light sources corresponding by positions in said array to a field between said low and high limits, for illuminating said field in said second primary color;

whereby said analog indication is illuminated either in said first primary color when said value of the signal does not lie within the bounds of said low and high limits or in said composite color when said value of the signal lies within the bounds of said low and high limits.

4,812,745
PROBE FOR TESTING ELECTRONIC COMPONENTS

Walter P. Kern, Cohasset, Mass., assignor to Teradyne, Inc., Boston, Mass.

Filed May 29, 1987, Ser. No. 56,102
Int. Cl.[4] G01R 1/06
U.S. Cl. 324—158 P 11 Claims



1. A hand-held probe for electrically contacting the lead of a mounted electronic component with a plurality of contact tip portions spaced from each other along said lead so as to provide a segment of desired length between said tip portions, said probe comprising

a probe guide member made of insulating material and having a probe surface adapted to be brought into close proximity to said lead and a plurality of holes extending through said member from said probe surface to another surface,

electrical wires positioned in said holes and having tip portions extending from said probe surface, said holes being located at said probe surface so as to cause said tip portions to be spaced from each other by said desired length, and

a support attached to said guide member,

said wires being sandwiched between said support and said guide member, said guide member covering said wires,

said wires bending where said holes end at said another surface to provide said contact tip portions along contact axes that are transverse to said probe surface,

said guide member and support having respective base ends, being secured to each other at said base ends, and extending separately in cantilever fashion from said base ends along longitudinal axes that are transverse to said contact axes,

said guide member and support having a dimension in a direction parallel to said contact axes that is less than the dimensions along said longitudinal axes and axes

transverse to said longitudinal axes and contact axes, thereby providing low profile to said probe when said probe surface is in close proximity to said lead.

4,812,746

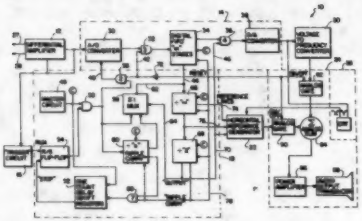
METHOD OF USING A WAVEFORM TO SOUND PATTERN CONVERTER

Stanley A. Dallas, Jr., Portland, Oreg., assignor to Thales Resources, Inc., Hillsboro, Oreg.

Continuation of Ser. No. 565,171, Dec. 23, 1983, abandoned. This application Nov. 10, 1986, Ser. No. 928,593

Int. Cl.[4] G01R *13/34*

U.S. Cl. 324—121 R **11 Claims**



1. A method comprising:

digitizing a time dependent signal to produce a plurality of discrete level signals representative of said time dependent signal;

producing a different audible tone signal for each level of said discrete level signals;

producing audible sounds by driving a speaker to produce an audibly perceptible reference frame indicative of a frame time duration using a signal which is separate from said audible tone signals and driving said speaker with said audible tone signals such that said audible tone signals have the same time orientation with respect to each other as said discrete level signals have in said time dependent signal; and

providing said audible sounds to a human listener to enable said listener to distinguish the shape of said time dependent signal based on the position and time relation of said audible tone signals relative to said reference frame signal.

4,812,747

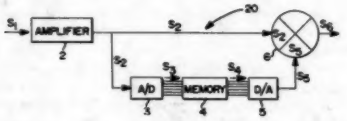
TRANSDUCER LINEARIZING SYSTEM

Allan R. Gale, Allen Park, and Lyle O. Hoppie, Birmingham, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 783,512, Oct. 3, 1985, abandoned. This application Sep. 30, 1987, Ser. No. 103,775

Int. Cl.[4] G01R *15/10*; G06F *15/353*

U.S. Cl. 324—132 **2 Claims**



1. Within an apparatus employing a single memory device, a method of effecting a high resolution linearization of an analog input voltage signal having a characteristic profile over a predetermined voltage range, said profile varying from an idealized profile by an error component, said error component equaling the arithmetic difference between the input and idealized profiles at finite points within said range, said method comprising:

digitizing said input signal;

addressing predetermined correction quantity data within said single memory device with said digitized input signal, said data comprising a finite number of constants, each constant correlating with an error component;

outputting said addressed constant as a digital error signal;

converting said digitized error signal to an equivalent analog error signal;

arithmetically adding said analog error signal with said input voltage signal in a summing junction; and

outputting the resultant sum of said analog error and input voltage signals as an approximation of said idealized profile.

4,812,748

METHOD AND APPARATUS FOR OPERATING A SCANNING MICROSCOPE

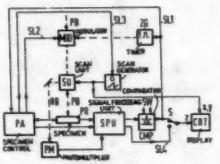
Hans-Detlef Brust, Dudweiler, and Johann Otto, Bad Toelz, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 27, 1986, Ser. No. 900,801

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1985, 3531129

Int. Cl.[4] G01R *31/28, 31/26*

U.S. Cl. 324—158 R **9 Claims**



1. A method for operating a scanning microscope having a probe generated in a probe-shaping portion and capable of being scanned over a specimen using a deflection unit, comprising the steps of:

establishing a defined operating condition in the specimen for testing;

scanning the probe point-by-point over regions of a specimen surface to be tested;

converting the effects triggered by the interaction of the specimen and the probe into electrical signals;

supplying said electrical signal to an arrangement for signal processing;

evaluating said electrical signal by said arrangement for signal processing; and

controlling said scanning step depending on an output signal from said arrangement for signal processing, said step of controlling including:

scanning at a first scan rate a region of the specimen surface in which an effect characteristic of a property to be investigated does not occur; and

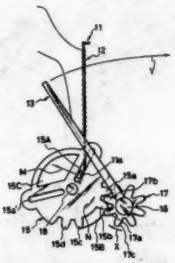
scanning at a lower second scan rate a region of the specimen in which said effect does occur.

4,812,749

BIMETALLIC INDICATOR

Yoshitake Sato; Toshio Ohike, and Youji Nakazaki, all of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

Filed Aug. 7, 1987, Ser. No. 82,583
Claims priority, application Japan, Aug. 8, 1986, 61-121035[U]
Int. Cl.[4] G01R 5/22, 5/26
U.S. Cl. 324—106 10 Claims



1. A bimetallic indicator, comprising:
a bimetal being deformed by an electric current supplied to a heat coil wound around the bimetal;
a pointer moved in relation to the deformation of the bimetal and indicating a measured value in accordance with an amount of electric current supplied to the heating coil;
a driving gear rotated by the deformation of said bimetal, and said driving gear including at least two first pitch portions each having a plurality of teeth with a regular pitch, and a second pitch portion provided between the first pitch portions and having a pitch smaller than that of the first pitch portion; and
a driven gear to which said pointer is mounted, and said driven gear having a plurality of teeth being engaged with said driving gear and rotated together with the pointer by the rotation of the driving gear, and the size of said driven gear smaller than the that of said driving gear for enlarging the rotational angle of the pointer;
wherein the rotation of the driving gear is transmitted to the driven gear only when the first pitch portion of the driving gear is in engagement with the driven gear.

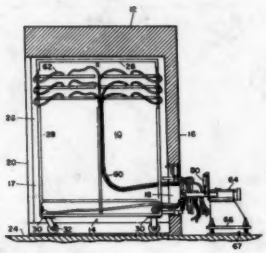
4,812,750

ENVIRONMENTAL STRESS SCREENING APPARATUS

Jerry L. Keel; Thomas M. Hines, both of Harvest; Glen Davis, and William E. Parks, both of Madison, all of Ala., assignors to Avex Electronics Inc., Huntsville, Ala.

Filed Sep. 28, 1987, Ser. No. 101,448
Int. Cl.[4] G01R 1/02, 1/04
U.S. Cl. 324—158 F 3 Claims

1. In a system for environmentally stressing electronic components the combination comprising:
a heat insulated temperature controlled chamber having a substantially open front closed by a full width, full height front access door and having a rear wall with an aperture therein, said chamber having a pair of spaced parallel tracks in the floor, said tracks extending from said open front to said rear wall;
a cart for carrying electronic components to be stressed within said chamber, said cart having wheels carried by said tracks, said cart also having a plurality of adjustable shelves for supporting said components;
a bustle having a plurality of electrical connections selectively connectable to said components, said bustle being mounted on the rear of said cart and being aligned with said aperture in said rear wall, and projecting through said aperture when said cart is positioned within said chamber, said bustle having a cross section complementary to said aperture, and dimensioned to provide a gap between the wall surrounding said aperture and said bustle, said bustle having access means enabling access to said connectors from outside the rear wall of said chamber;
a seal mounted on said bustle for sealing the gap between said bustle and the surrounding wall;
a plurality of current carrying busses mounted on said cart,



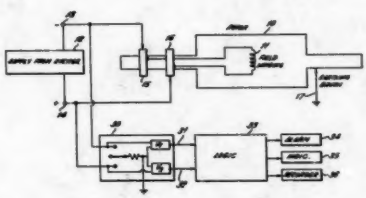
said busses being selectively connectable to components to be stressed and to selective connections in said bustle;
a complimentary connector positioned outside of said chamber in alignment with said bustle, said complimentary connector having connections mating with the connections in said bustle, electrical input currents being supplied to selected ones of said connections of said complementary connector, and electrical output signals being derivable from selected other ones of said connections.

4,812,751

APPARATUS FOR MONITORING EARTH FAULTS ON THE ROTOR WINDING OF A GENERATOR

Ian A. Roberts, Horsham, and Colin Hargis, Bristol, both of United Kingdom, assignors to The Central Electricity Generating Board, London, England

Filed Jun. 2, 1986, Ser. No. 869,774
Int. Cl.[4] G01R 31/06; G08B 21/00
U.S. Cl. 324—546 12 Claims



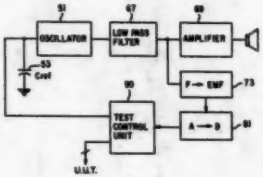
1. Apparatus for monitoring ground faults on an exciter winding on a grounded rotor of a generator comprising a resistive impedance, switch means arranged for selectively opening and closing a connection connecting the resistive impedance between the grounded rotor and at least one of the ends of the winding, means for determining voltages V_1 and V_2respectively between ground and the two ends of the winding, and logic means responsive to the determined voltages $V_1$and V_2 for providing an indication of the fault position, represented by the ratio of V_1 to (V_1+V_2) when the switch is in an open circuit position.

4,812,752

OPEN FINDER

Ernest A. Preuss, Roselle Park, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Oct. 19, 1987, Ser. No. 110,170
Int. Cl.[4] G01R 27/26, 31/04; H03K 3/284
U.S. Cl. 324—542 14 Claims



1. Apparatus for detecting and locating open circuit faults in a cable bundle having a plurality of conductors and a first and second end, comprising:

(a) an oscillator having a frequency of oscillation at an output and two output terminals, one to be connected to one of said conductors and the other to be connected to a second of said conductors so as to modify said frequency of oscillation according to the capacitance between said two input terminals so that said oscillator will have a modified frequency of oscillation at said output,

(b) a filter having an output and an input connected to said output of said oscillator, said filter alternating said frequency of oscillation, and

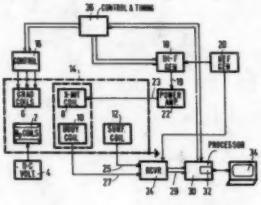
(c) means for indicating the frequency at said output of said filter, which means for indicating can be interpreted to detect and locate open circuit faults in the cable.

4,812,753

METHOD AND ARRANGEMENT FOR DETERMINING A CORRECTED MRI SURFACE COIL IMAGE

Miha Fuderer, and Johannes J. M. Cuppen, Both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Nov. 4, 1987, Ser. No. 117,121
Claims priority, application Niger, Nov. 7, 1986, 8602821
Int. Cl.[4] G01R 33/20
U.S. Cl. 324—307 17 Claims



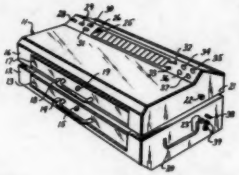
1. A method of determining a nuclear magnetization distribution in a part of a body in which resonance signals are produced, in which detection of a first group of resonance signals takes place with the use of a surface coil and detection of a second group of resonance signals takes place with the use of a body coil, characterized in that a correction is carried out by information obtained from the second group of resonance signals on data derived from the first group of resonance signals.

4,812,754

CIRCUIT BOARD INTERFACING APPARATUS

Theodore A. Tracy, 5861 Carbeck, Huntington Beach, Calif. 92648, and George H. Freuler, 1164 North Holly St., Anaheim, Calif. 92801

Filed Jan. 7, 1987, Ser. No. 1,162
Int. Cl.[4] G01R 31/02
U.S. Cl. 324—158 F 24 Claims



1. An apparatus for interfacing a circuit board to a testing system, comprising:

a support structure with which to movably support a pair of test heads;

a pair of first and second test heads mounted in confronting relationship on the support structure, at least the first test head having a plurality of probes with which to contact a corresponding plurality of test points on a circuit board to be tested;

actuating means for enabling movement of the test heads from a loading position enabling placement of the circuit board between the test heads to a testing position in which each one of the probes is urged into contact with a respective one of the test points;

electrical bus means, including a plurality of electrically conductive lines, for interfacing a separate testing system to at least the first test head, each of the electrically conductive lines being connected to a respective one of the plurality of probes on the first test head; and

diagnostic access means for enabling an operator to electrically connect a separate test probe to a selected one of the plurality of probes on the first test head for diagnostic purposes while the first and second test heads are in the testing position;

said diagnostic access means including a panel of electrically conductive contacts mounted on the support structure;

each of the electrically conductive contacts being electrically connected to a respective one of the plurality of probes on the first test head;

whereby an operator can electrically connect the test probe to a selected one of the probes for diagnostic purposes by contacting an appropriate one of the electrically conductive contacts.

4,812,755

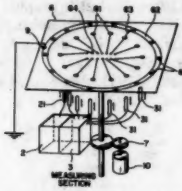
BASE BOARD FOR TESTING INTEGRATED CIRCUITS

Nakaie Toshiyuki, Wakayama, and Oonishi Tethuo, Naga, both of Japan, assignors to Hanwa Electronic Co., Ltd., Wakayama, Japan

Filed May 28, 1987, Ser. No. 55,195
Claims priority, application Japan, Jun. 5, 1986, 61-84733[U]
Int. Cl.[4] G01R 31/26, 1/04
U.S. Cl. 324—158 F 10 Claims

1. A plug board for testing integrated circuits, comprising a plurality of sockets for receiving therein the terminals of an integrated circuit to be tested, a plurality of contacting terminals arranged in an annular layout and electrically connected

to said sockets, an annular earthing belt electrically connected to said contacting terminals and adapted for grounding, and a



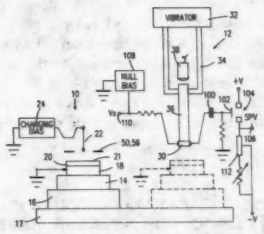
drive system adapted to rotate said plug board about the center of said contacting terminals.

4,812,756

CONTACTLESS TECHNIQUE FOR SEMICONDUTOR WAFER TESTING

Huntington W. Curtis, Chelsea; Min-Su Fung, LaGrangeville, and Roger L. Verkuil, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 26, 1987, Ser. No. 89,648
Int. Cl.[4] G01R *31/00*
U.S. Cl. 324—158 R **12 Claims**



1. A contactless measurement method for testing a doped wafer with an insulator layer disposed thereover, comprising the steps of:

depositing charges on the top surface of said insulator layer to create an inverted surface with a depletion region and thereby a field-induced junction in the wafer therebelow with an accumulated guard ring on the wafer surface;

changing the depth to which said depletion region extends below said inverted wafer surface to create a surface potential transition, and

measuring a parameter of the resultant surface potential transient between the top surface of said insulator layer and the bulk of said wafer.

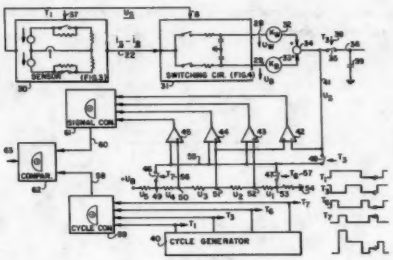
4,812,757

METHOD AND DEVICE FOR ACCURATELY DETERMINING THE DISTANCE OF A MAGNETIC SENSOR FROM A CONDUCTIVE REACTION RAIL

Jürgen Meins, Baldham, and Helmut Grosser, Heringen, both of Fed. Rep. of Germany, assignors to Thyssen Industrie AG, Fed. Rep. of Germany

Filed Nov. 5, 1986, Ser. No. 927,755
Int. Cl.[4] G01B *7/14*; G01N *27/72*; G01R *33/00*; B60L *13/06*
U.S. Cl. 324—207 **21 Claims**

8. A device for accurately determining the distance of a magnetic sensor from a reaction rail having regular grooves comprising: a sensor coil positioned to be largely magnetically coupled to the reaction rail, a reference coil positioned to be only slightly magnetically coupled to the reaction rail, alternating voltage means for applying alternating voltage having a cycle rate to each of the sensor coil and reference coil for causing coil currents having active and reactive current portions to pass through the sensor coil and reference coil, an additional sensor coil impedance and a reference coil impedance for each of the sensor coil and reference coil respectively, a sensor switch bridging the sensor coil impedance and a reference switch bridging the reference coil impedance each switch operable to add and to remove additional impedance to each of the sensor coil, each switch and reference coil respectively, means for synchronously operating the switch at the cycle rate of the alternating voltage, difference current measurement means connected to each of the sensor coil and reference coil for measuring a difference current between the sensor coil current and the reference coil current during measuring periods with the added impedance removed and for measuring



a difference current between the sensor current and the reference coil current during test periods with the additional impedance added, said difference currents having active and reactive difference current portions, means for separating the active and reactive difference current portions and means for deriving rectified and smoothed active and reactive signals therefrom, the grooves causing fluctuations in the active and reactive signals as the sensor moves with respect to the reaction rail, means for minimizing said fluctuations by conditioning the active and reactive signals such that the influence of the grooves on said active and reactive signals is equally great but in opposite directions, and means for adding the conditioned active and reactive signals together to form an output signal as a measurement indicative of the distance between the sensor and the reaction rail and of the operating of the device.

4,812,758

METHOD OF OPERATING AN AMORPHOUS-MAGNETIC-ALLOY SENSOR

Ichiro Yamashita, Hirakata; Masayuki Wakamiya, Suita; Hiroyuki Hase, Katano, and Shinya Tokuono, Ashiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 18, 1986, Ser. No. 853,717
Claims priority, application Japan, Apr. 18, 1985, 60-82870; May 8, 1985, 60-97218
The portion of the term of this patent subsequent to Dec. 2, 2003, has been disclaimed.
Int. Cl.[4] G01B *7/24*; G01R *33/18*; G01L *9/16*
U.S. Cl. 324—209 **8 Claims**

1. A method of operating an amorphous-alloy sensor of the type excited by a magnetic field, comprising the steps of:

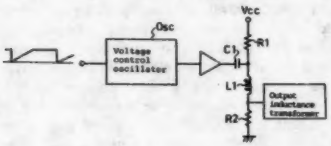
impressing an electric current through a coil for exciting a magnetic field on a magnetic circuit which contains at least one amorphous magnetic alloy part,

said electric current being an alternating current superposed with a cyclically recurring rectangular current which has, in each cycle thereof, a large amplitude at a start-up point and which converges to a smaller amplitude after a predetermined time period,

impressing a measurement object on said amorphous mag-

netic alloy part for measuring the intensity of said measurement object,

detecting the changes of the magnetic characteristics of said magnetic circuit, and



outputting signals in proportion to the intensity of said measurement object.

4,812,759

METHOD FOR MEASURING AND CORRECTING THE INDUCED MAGNETIZATION IN A NAUTICAL VESSEL

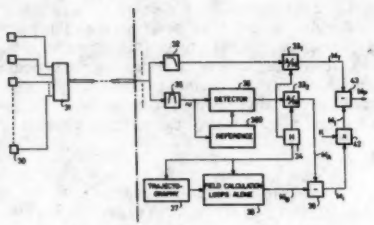
Francois Duthoit, Brest, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 11, 1986, Ser. No. 872,839

Claims priority, application France, Jun. 14, 1985, 85 09071

Int. Cl.[4] G01N *27/72;* **G01R** *33/02;* **H01F** *13/00;* **H01H** *47/00*

U.S. Cl. 324—226 **13 Claims**



13. A measuring base wherein said base comprises:

at least one sensor means having a sensor for measuring the magnetic field disturbed by a vessel wherein said vessel induces a magnetic field and wherein said sensor means further includes means for isolating, in the signals outputted from said sensor, an alternating component,

synchronous detecting means for detecting a direct component, in order to determine the route followed by the vessel,

means for determining an inductive field produced by currents flowing in said sensor,

means of subtracting from a signal detected, a signal supplied by the means for determining the inductor field,

means for multiplying the signal issuing from the subtraction means by a proportionality coefficient which has a value between the value of the inductor field and a magnetic field of the earth, and

means for supplying a signal which is representative of the value of the induced magnetization caused by said vessel.

4,812,760

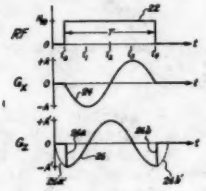
MULTI-DIMENSIONAL SELECTIVE NMR EXCITATION WITH A SINGLE RF PULSE

Paul A. Bottomley, Clifton Park; Christopher J. Hardy, Schenectady; Matthew O'Donnell, Schenectady, and Peter B. Roemer, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 27, 1987, Ser. No. 78,427

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **25 Claims**



1. A NMR rotating-gradient ρ pulse for providing two-dimensional spatially-selective NMR excitation of a portion of a sample immersed in a static magnetic field, comprises:

a single pulse of an RF signal applying a H_1 magnetic field to the sample with a selected envelope amplitude characteristic for nutating spins in said sample portion through substantially 180° in a pulse time interval T; and

a net magnetic field gradient, applied to the sample in the presence of the magnetic field of the RF signal pulse, having a direction varying in a pair of spatial dimensions in which selection is to occur during said interval T.

4,812,761

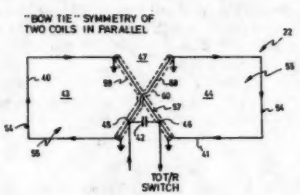
ELECTRICALLY PARALLEL EQUAL PHASE RESONANT LOOPS FOR NUCLEAR MAGNETIC RESONANCE SURFACE COILS

J. Thomas Vaughan, Jr., Dallas, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Filed Sep. 24, 1987, Ser. No. 100,583

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—307 **15 Claims**



1. A nuclear magnetic resonance measurement system, comprising in combination:

means for generating an applied main magnetic field;

an array of at least two radio frequency current loops, each loop being responsive to a radio frequency signal to generate a radio frequency magnetic field having a component in a direction orthogonal to the direction of the applied main magnetic field, the loops being electrically connected in parallel, the loops being oriented in a generally planar relationship with respect to each other, the loops being noncoaxial, the loops being connected in phase with respect to each other so that the component of the radio frequency magnetic field generated by the loops which is

orthogonal to the direction of the applied main magnetic field is in the same general direction.

4,812,762

FAST METHOD AND DEVICE FOR DETERMINING AN NMR DISTRIBUTION IN A REGION OF A BODY

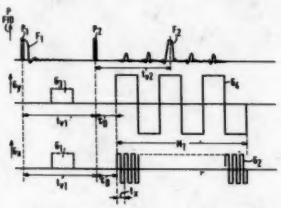
Johannes H. Den Boef, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 774,129, Sep. 9, 1985, abandoned. This application Dec. 22, 1987, Ser. No. 136,515

Claims priority, application Netherlands, Sep. 28, 1984, 8402959

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **23 Claims**



1. A method of determining an NMR distribution in a region of a body situated in a steady, uniform magnetic field, said method comprising the steps of:

(a) generating an r.f. electromagnetic pulse during a preparation period in order to cause a precessional motion of the magnetization of the nuclei in the body so as to generate a resonance signal,

(b) then during a subsequent measurement period, generating a steady gradient magnetic field, a first alternating, periodic gradient magnetic field with a gradient direction extending in a first direction and a second alternating, periodic gradient magnetic field with a gradient direction extending perpendicularly to said first direction, said measurement period being divided into a number of sampling intervals,

(c) during said measurement period taking a sample of said resonance signal during each of said sampling intervals so as to obtain a plurality of signal samples, and

(d) then repeating, each time after a waiting period, steps (a), (b) and (c), said preparation period having a different duration during each repetition so as to obtain a group of signal samples from which, after Fourier transformation thereof, an image of a nuclear magnetization is determined.

4,812,763

ELECTRON SPIN RESONANCE SPECTROMETER

Klaus-Dieter Schmalbein, Marxzell-Burbach, Fed. Rep. of Germany, assignor to Bruker Analytische Mebtechnik GmbH Silberstreifen, Rheinstetten-Forchheim, Fed. Rep. of Germany

Filed Nov. 20, 1987, Ser. No. 123,146

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1987, 3726046

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—316 **7 Claims**

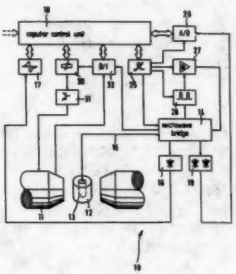
1. An electron spin resonance spectrometer comprising:

an electromagnet for generating a magnetic field of constant strength and high homogeneity over a predetermined space;

a microwave resonator arranged in said space and receiving a sample under investigation;

a microwave generator for generating a continuous wave microwave signal and for supplying microwave energy to a microwave bridge, said microwave bridge being connected to said resonator to supply microwave energy to said resonator and being, further, connected to signal detection means for receiving and processing signals emitted from said resonator;

microwave signal shaping means arranged between said microwave generator and said microwave bridge, said shaping means comprising a microwave divider for dividing an output signal of said microwave generator into portions thereof and for feeding said portions to a plurality



of pulse shaping channels arranged in parallel to each other, said shaping means further comprising a microwave combiner for combining output signals of said pulse shaping channels, said pulse shaping channels having each first means for switching microwave continuous wave signals, second means for controlling an amplitude of said signals and third means for controlling a phase of said signals, said microwave combiner feeding said combined output signals to a microwave power amplifier arranged to supply said microwave energy to said microwave bridge.

4,812,764

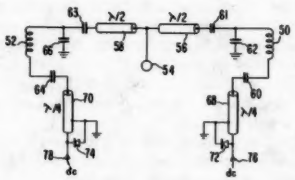
CALIBRATED DECOUPLING OF TIGHTLY COUPLED CONCENTRIC SURFACE COILS

Max R. Bendall, Queensland, Australia, assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Mar. 31, 1988, Ser. No. 175,700

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—318 **4 Claims**



1. Apparatus for controlling the shape and magnitude of the RF field applied to a body through active decoupling of a plurality of RF coils comprising,

an RF source for providing RF energy having a power spectrum including a frequency component ω_0;

a plurality of resonant circuits, first said resonant circuit comprising a first coil and a second said resonant circuit comprising a second coil, said first and second coils proximally disposed, each said resonant circuit capable of exhibiting resonant behavior at frequency ω_0, said second resonant circuit comprising a plurality of frequency dependent reactive portions, at least one said reactive portion including means for receiving control information

and capable of exhibiting very different frequency dependence in accord with said control information;

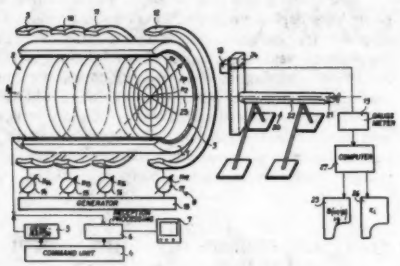
RF coupling means for applying said RF energy in common to each said resonant circuit, circuit means for supplying said control information to said second resonant circuit whereby the resonant behavior of said second resonant circuit is altered in a first sense of frequency offset with respect to ω_0, to cause induction of RF current having a phase ϕ in said first coil due to said second coil and for altering the resonant behavior of said second resonant circuit in a second sense of frequency offset relative to ω_0 to cause induction of an RF current having a phase $-\phi$ in said first coil, whereby the combined RF field due to both said coils is selectively controllable in magnitude and spatial distribution.

4,812,765

METHOD OF ADJUSTING THE HOMOGENEITY CORRECTORS OF THE MAGNETIC FIELD CREATED BY A MAGNET

Guy Aubert, Grenoble, France, assignor to Centre National de la Recherche Scientifique, Paris, France

Filed May 11, 1987, Ser. No. 48,731
Claims priority, application France, May 13, 1986, 86 06861
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—320 **6 Claims**



1. A method of adjusting the homogeneity correctors of the magnetic field created by a magnet, including the following phases:

the real field created by the magnet is measured,

the analytic expression of the measured real field is calculated over a base of N orthogonal functions, this analytic expression being expanded as a summation of N orthogonal components each component being the result of the multiplication of one of said orthogonal function by a specific coefficient, the number of these specific coefficients being equal to N, said N specific coefficients representing said real field,

the analytic expressions of fields produced by N correction means as a function of their adjustment state are calculated in a same manner over the same base,

the analytic expression of an ideal field to be obtained with the magnet is calculated in a same manner over the same base,

an algebraic combination is made of the analytic expressions of the correction fields so as to make it equal, and of opposite sign, to the difference of the analytic expressions of the real and ideal fields,

said algebraic combination comprising a step of giving a solution to a system of N equations related to the N orthogonal functions, with N unknowns, said N unknowns being each in correspondence to a particular correction means of said N correction means,

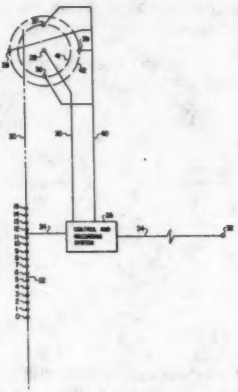
and the N correction mean are adjusted as a function of the results of this algebraic combination.

4,812,766

TELLURIC NOISE CANCELLATION IN INDUCED POLARIZATION PROSPECTING

James D. Klein, McKinney, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 2, 1987, Ser. No. 115,328
Int. Cl.[4] G01V *3/02, 3/08, 3/38*
U.S. Cl. 324—362 **8 Claims**



1. A method of providing an indication of direction and amplitude of a telluric noise component of induced polarization signals, with said indication being substantially free of induced polarization signals comprising:

positioning first and second telluric noise sensing electrodes on the earth's surface on an equipotential line located about a current electrode which forms part of an induced polarization electrode spread;

positioning at least one additional electrode on said equipotential line;

detecting telluric noise by means of said first and second noise sensing electrodes simultaneously with detection of induced polarization signals by means of said spread; and detecting telluric noise by means of said at least one additional electrode in a direction orthogonal to the dipole formed by said first and second electrodes.

4,812,767

OPTICAL APPARATUS USING ANOMALOUSLY STRONG MAGNETO-BIREFRINGENCE OF MAGNETIC FLUID

Susamu Taketomi, 35-8, Higashisakamoto 2-chome, Kagoshima City, Kagoshima Prefecture, Japan

Continuation-in-part of Ser. No. 486,240, Apr. 18, 1983, abandoned. This application Jun. 24, 1986, Ser. No. 877,790
Claims priority, application Japan, Apr. 18, 1982, 57-64518; May 1, 1982, 57-74100; Jun. 15, 1982, 57-101455
Int. Cl.[4] G01R *33/032;* **G02F** *1/09;* **G02B** *5/30*
U.S. Cl. 324—244 **15 Claims**

1. An apparatus for controlling a light intensity of a light beam which comprises:

a light source;

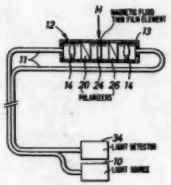
a first optical fiber connected to said light source;

a polarizing unit connected to said first optical fiber and including a first lens, a polarizer, a magnetic fluid thin film element containing a fluid consisting of fine ferromagnetic particles having a particle density of more than 10^{15} particles/cc in a colloidal solution, an analyzer and a second lens;

a second optical fiber connected to said polarizing unit and a photo-detector; eachof the above recited elements being

mounted so as to be aligned sequentially adjacent to each other in a row on a light axis; and

a magnetic field producer arranged near said magnetic fluid thin film element for applying an adjustable magnetic field to said magnetic fluid thin film element in a direction which is perpendicular to the light axis;



wherein said field producer renders said magnetic fluid thin film element birefringent and said light intensity is controlled by the light beam through said analyzer after passing through said magnetic fluid thin film element.

4,812,768

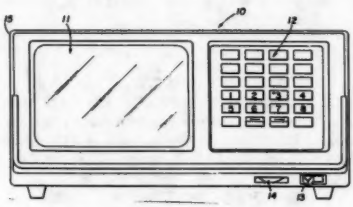
DIGITAL ENGINE ANALYZER

Robert O. Quinn, Wheeling, Ill., assignor to Snap-on Tools Corporation, Kenosha, Wis.

Division of Ser. No. 769,150, Aug. 23, 1985. This application Oct. 9, 1987, Ser. No. 89,241

Int. Cl.[4] G01M *15/00*

U.S. Cl. 324—379 **6 Claims**



1. An engine analyzer for analyzing an internal combustion engine that produces engine signals, comprising a cathode ray tube for displaying a waveform corresponding to a selected engine signal which is continuously updated as and when the corresponding selected engine signal changes, means for selecting an RPM setpoint operating mode for the engine analyzer, means for selecting the magnitude of the RPM setpoint, means for determining the time between ignition signals and converting such time into engine speed in RPM, means for storing the engine speed in RPM thus calculated, and means for freezing the waveform displayed on said cathode ray tube to be that corresponding to the selected engine signal which was being produced when the engine speed reaches or exceeds the RPM setpoint.

4,812,769

PROGRAMMABLE SAMPLING TIME BASE CIRCUIT

Agoston Agoston, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 30, 1986, Ser. No. 858,490

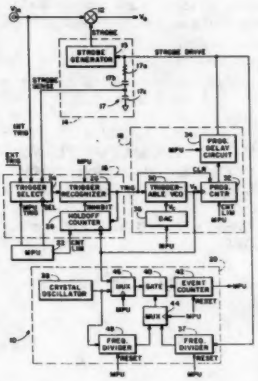
Int. Cl.[4] H03K *5/04, 3/017*

U.S. Cl. 328—63 **7 Claims**

1. A time base circuit for producing a strobe signal following detection of a triggering event in a waveform, the time base circuit comprising:

a trigger generator for generating a trigger signal selectively in response to one of said triggering event and a strobe sense signal;

means responsive to said trigger signal for producing the



strobe signal and the strobe sense signal an adjustable delay time following said trigger signal; and

means for measuring a period between successive strobe signals produced when the trigger generator generates trigger signals in response to strobe sense signals and adjusting said adjustable delay time such that said period has predetermined value.

4,812,770

SATURABLE REACTOR CURRENT PULSE GENERATOR

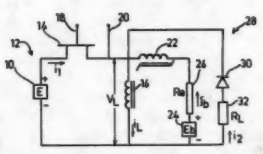
David Dravkin, Rehovot, Israel, assignor to Israel Aircraft Industries Ltd., Lod, Israel

Filed May 12, 1987, Ser. No. 48,798

Claims priority, application Israel, May 16, 1986, 78810

Int. Cl.[4] H03K *3/30, 3/45*

U.S. Cl. 328—67 **19 Claims**



1. A current pulse generator operable during a charging period to receive power from an external power supply and operable to deliver a substantially constant current pulse of variable width to a connected load during a discharging period, said generator comprising:

a source means for providing initial energy;

an energy storage means;

a saturable device means operatively associated with said source means and said energy storage means to direct said initial energy for storage in said energy storage means, said saturable device being in a saturation state prior to said charging period; and

a switch means connecting said external power supply to said generator, said switch being operable to control the duration of said charging period,

such that for the duration of said charging period said satura-

ble device means leaves said saturation state and additional energy from said external power supply accumulates in said energy storage means above the level of said initial stored energy,

said additional energy producing a current pulse upon dissipation in the load during said discharging period commencing at the end of said charging period,

said saturable device means automatically reentering said saturation state at the moment said additional energy dissipation ceases,

said current pulse being repeatable with varying pulse width in accordance with the operation of said switch means.

4,812,771

EXPANDER SYSTEM FOR PULSE SIGNALS

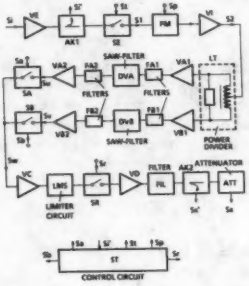
Alfred Lauper, Obfelden, and Andreas Steffen, Schlieren, both of Switzerland, assignors to Siemens-Albis, Zurich, Switzerland

Filed Jun. 19, 1986, Ser. No. 876,145

Claims priority, application Switzerland, Oct. 23, 1985, 04566/85

Int. Cl.[4] H03K *5/22, 5/00*

U.S. Cl. 328—109 **3 Claims**



1. An expander system, comprising:

an expander filter with subsequently connected amplifier means;

a phase modulator receiving repetitive pulse signals of time length Ti generated from an input AC-signal, wherein the phase modulator comprises two ring transformers, whereby the primary winding of the first transformer forms the input and the primary winding of the second transformer forms the output of the modulator, a first terminal of the secondary winding of the first transformer being connected through a first diode to a first terminal of the secondary winding of the second transformer and through a second diode, connected in reverse direction, to a second terminal of the secondary winding of the second transformer, and the second terminal of the secondary winding of the first transformer being connected through a third diode to the second terminal of the secondary winding of the second transformer and through a fourth diode, connected in reverse direction, to the first terminal of the secondary winding of the second transformer;

said phase modulator being connected in series with and preceding said expander filter;

said phase modulator, expander filter and amplifier means being able to process the pulse signals and said amplifier means providing an output signal of the system; and

a control stage for generating a control signal from the input AC-signal for selectively enabling and inhibiting said phase modulator such that, within the time length Ti of a one of said repetitive pulse signals, at least two phase changes of at least approximately 180 degrees are produced.

4,812,772

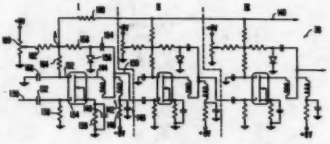
SPECTRUM ANALYZER AND LOGARITHMIC AMPLIFIER THEREFOR

R. Andrew Hatfield, Richmond, Va., assignor to AVCOM of Virginia, Inc., Richmond, Va.

Division of Ser. No. 734,115, May 15, 1985, Pat. No. 4,720,673. This application Oct. 7, 1987, Ser. No. 105,241

Int. Cl.[4] G06G *7/24*

U.S. Cl. 328—145 **6 Claims**



1. A logarithmic amplifier for logarithmically compressing an input signal having a large dynamic range, said logarithmic amplifier comprising:

a plurality of cascaded amplifier stages, each stage including an amplifier having a variable gain, an input for controlling said variable gain, a signal input for receiving a signal to be amplified, an amplifier output, and a feedback path connected between said amplifier output and said gain control input, said feedback path including means for controlling the gain of said amplifier such that an output of said gain control means is related to the logarithm of the signal on said on said signal input;

means for combining the outputs of said control means of said plurality of said stages to each other; and

means for biasing said stages such that the combined outputs cover a greater dynamic range than a single-stage and approximate the logarithm of said large dynamic range input signal.

4,812,773

FILTER ADJUSTMENT APPARATUS AND METHOD

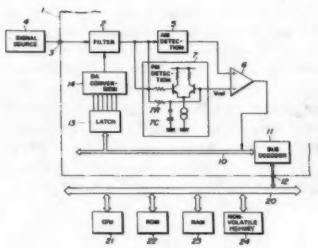
Yoshihiro Yamamoto, Tokyo; Tsutomu Kume, Ibaraki; Nobuo Yamazaki; Fumiharu Hashimoto, both of Tokyo, and Koichi Ohya, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 28, 1987, Ser. No. 138,516

Claims priority, application Japan, Dec. 27, 1986, 61-315052

Int. Cl.[4] H03B *1/04;* **H03K** *5/00*

U.S. Cl. 328—167 **7 Claims**



1. A filter adjustment apparatus comprising:

a filter circuit,

means responsive to variable filter adjustment data for adjusting the filter characteristics of said filter circuit;

an input terminal for supplying a constant frequency input signal;

a level detecting means for detecting an output produced by the filter circuit;

a comparator means connected to said level detector and to a reference level for producing a signal corresponding to the difference between an output of said level detector and said reference level; and

a control means connected to said comparator means for determining optimum filter adjustment data based on the signal from the comparator means,

said control means responds to the output from the comparator means when the filter adjustment data are changed, while said filter circuit is supplied with said constant frequency input, and determining the optimum filter adjustment data based on the output thus detected.

4,812,774

ELECTRON BEAM STABILIZING METHOD FOR ELECTRON STORING RING, AND ELECTRON STORING RING SYSTEM

Koji Tsumaki, Hitachi; Kenji Miyata, and Masatsugu Nishi, both of Katsuta, all of Japan, assignors to Hitachi, Ltd, Tokyo, Japan

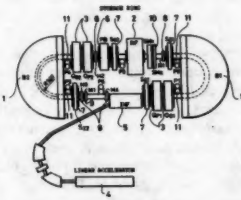
PCT No. PCT/JP87/00115, § 371 Date Oct. 23, 1987, § 102(e) Date Oct. 23, 1987, PCT Pub. No. WO87/05461, PCT Pub. Date Sep. 11, 1987

PCT Filed Feb. 23, 1987, Ser. No. 130,234

Claims priority, application Japan, Feb. 26, 1986, 61-39229

Int. Cl.[4] H05H *7/00*

U.S. Cl. 328—233 **5 Claims**



1. An electron beam stabilizing method for suppressing the instability of an electron beam in an electron storage ring comprising the steps of:

(1) superimposing a voltage component fluctuating with time on a power supply of a focusing magnet of said ring;

(2) fluctuating the intensity of said focusing magnet to change the betatron frequency of said electron beam.

4,812,775

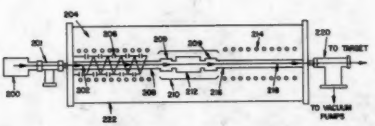
ELECTROSTATIC ION ACCELERATOR

Robert E. Klinkowstein, Winchester, and Ruth Shefer, Newton, both of Mass., assignors to Science Research Laboratory, Inc., Somerville, Mass.

Continuation-in-part of Ser. No. 857,765, Apr. 30, 1986, abandoned. This application Jul. 20, 1987, Ser. No. 72,883

Int. Cl.[4] H05H *1/03*

U.S. Cl. 328—233 **27 Claims**



1. An electrostatic ion accelerator comprising:

a negative ion source adapted for generating a minimum ion current of approximately 0.2 milliamperes,

a high voltage terminal,

a stripping cell located in said terminal,

a first accelerating column connected between said ion source and said stripping cell,

a second accelerating column connected between said stripping cell and said target,

means connected to said first and second accelerating columns for maintaining a high vacuum therein, and

solid state power supply means connected to said ion source and said terminal for supplying a positive potential of at least 1MV to said terminal.

4,812,776

SYSTEM FOR AMPLIFYING AND SHAPING OPTICAL PULSES

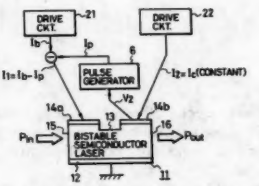
Shinya Sasaki, Kodaira, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 26, 1986, Ser. No. 833,040

Claims priority, application Japan, Mar. 4, 1985, 60-41324

Int. Cl.[4] H01S *3/103*

U.S. Cl. 330—4.3 **2 Claims**



1. A system for amplifying and shaping optical pulses comprising a bistable laser which has first and second light emission states based on hysteresis characteristics between a light emission output and a drive current and between the light emission output and injected light, a drive circuit which supplies said laser with a drive current corresponding to a middle point of the hysteresis characteristic thereof, detection means to detect that said laser has been switched from the first light emission state into the second light emission state by the injected light, and drive current control means to change the drive current after a predetermined time in response to an output of said detection means, thereby to switch said laser into the first light emission state, wherein said bistable laser is a semiconductor laser which has a plurality of segmented electrodes on one side thereof, said detection means is a means to detect a voltage change in one of said plurality of electrodes, and said drive current control means includes a pulse generator which changes the drive current for one of said plurality of electrodes.

4,812,777

MANUALLY/ELECTRICALLY OPERATED BRAKE SYSTEM

Kenji Shirai, Mishima, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 8, 1987, Ser. No. 71,131

Claims priority, application Japan, Jul. 12, 1986, 61-164234

Int. Cl.[4] B60T *11/18, 8/08*

U.S. Cl. 303—14 **6 Claims**

1. A manually/electrically operated brake system for applying a brake to a wheel of a vehicle, comprising:

a brake operating member;

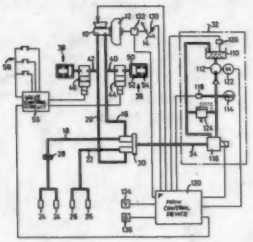
a master cylinder operated by said brake operating member, to generate a manually controlled fluid braking pressure according to an operation of said brake operating member;

a wheel brake cylinder for applying a brake to said wheel;

a primary fluid passage for connecting said master cylinder to said wheel brake cylinder;

electrically controlled pressure generating means for generating an electrically controlled fluid braking pressure to produce a required braking effect which is determined based on at least one of an operating force and an operating stroke of said brake operating member;

switching valve means provided in said primary fluid passage, for applying said electrically controlled braking pressure to said wheel brake cylinder while disconnecting said master cylinder from said wheel brake cylinder when said electrically controlled pressure generating means is operative, and for applying said manually controlled braking pressure to said wheel brake cylinder while disconnecting said electrically controlled pressure generating means from said wheel brake cylinder in the event of a failure of said electrically controlled pressure generating means; and



at least one fluid absorber connected to a part of said primary fluid passage between said switching means and said master cylinder, for temporarily accommodating the brake fluid of said manually controlled braking pressure delivered from said master cylinder upon operation of said brake operating member, said at least one fluid absorber returning the brake fluid therefrom to said master cylinder upon releasing of said brake operating member.

4,812,778

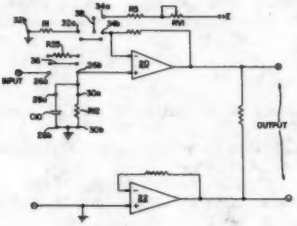
ISOLATION AMPLIFIER

Leon Gryk, New Britain, Conn., assignor to Electro-Mechanics, Inc., New Britain, Conn.

Filed Jan. 25, 1988, Ser. No. 148,016

Int. Cl.[4] H03F *3/68*

U.S. Cl. 330—51 **16 Claims**



1. An isolation amplifier for connection between a source of an information bearing signal and a control system responsive to the information provided by the source, the source having a pair of terminals between which the information bearing signal is measured, said isolation amplifier comprising;

first operational amplifier means, said first amplifier means having inverting and non-inverting signal input terminals and a signal output terminal;

second operational amplifier means, said second amplifier means having inverting and non-inverting signal input terminals and a signal output terminal;

a first input signal terminal, said first input signal terminal being connectable to a first terminal of the information bearing signal source;

a second input signal terminal, said second input signal terminal being connectable to a second terminal of the information bearing signal source;

first variable input circuit means for connecting said first input signal terminal to one of said first operational amplifier means signal input terminals, said first input circuit means including;

a first pair of spaced connectors in series with said first input signal terminal and said operational amplifier means signal input terminal whereby a passive circuit component may be inserted and electrically connected between said first input signal terminal and said operational amplifier means signal input terminal; and

second pair of spaced connectors in series with a first connector of said first pair of connectors and the said second input signal terminal whereby a passive circuit component may be inserted and electrically connected between said first connector of said first pair of connectors and said second input signal terminal; second variable circuit means,

said second variable circuit means including;

a third pair of spaced connectors in series with the other of said first operational amplifier means signal input terminals and said second input signal terminal whereby a passive circuit component may be inserted and electrically connected between said first operational amplifier means other input terminal and said second input signal terminal to vary the gain of said first operational amplifier means; and

means for applying an adjustable bias voltage to said other of said first operational amplifier means signal input terminals, said applying means including a pair of spaced contacts whereby said first operational amplifier means other signal input terminal may selectively be isolated from the bias voltage; and

means connecting the said second input signal terminal to a first input signal terminal of said, second operational amplifier means whereby an output signal related to the information bearing input signal may be measured between said operational amplifier means output terminals.

4,812,779

LOW-POWER FEEDFORWARD AMPLIFIER

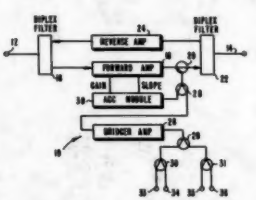
R. Steven Wagner, El Paso, Tex., assignor to Texscan Corporation, Scottsdale, Ariz.

Continuation of Ser. No. 833,651, Dec. 8, 1986, Pat. No. 4,677,390. This application Jun. 29, 1987, Ser. No. 67,805

The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.

Int. Cl.[4] H03F *1/26*; H03G *3/10*

U.S. Cl. 330—149 **13 Claims**



1. A low-power feedforward amplifier, comprising:

(a) a main amplifier;

(b) means for comparing a sample of an input signal supplied

to said main amplifier with a sample of an output signal from said main amplifier, said comparing means producing an error signal proportional to the difference between said signal samples; and

(c) means for amplifying said error signal and combining the amplified error signal with the main amplifier output signal in opposite phase, whereby distortion and noise products generated by said main amplifier are substantially cancelled, said amplifying and combining means including a high-gain error amplifier having power consumption below that required by a conventional medium-gain hybrid amplifier.

4,812,780

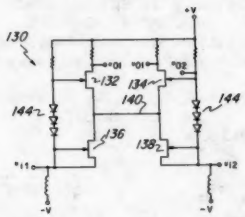
BROADBAND DIFFERENTIAL AMPLIFIER

Dale E. Zimmerman, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 855,546, Apr. 23, 1986. This application Mar. 10, 1988, Ser. No. 166,142

Int. Cl.[4] H03F *3/45*

U.S. Cl. 330—253 **12 Claims**



1. A differential amplifier, comprising:

(a) first and second field effect transistors, the sources of said transistors electrically connected;

(b) first and second inputs electrically connected to the gates of said first and second transistors, respectively;

(c) a first current source electrically connected from said first transistor source to said first input;

(d) a second current source electrically connected from said second transistor source to said second input; and

(e) first and second outputs connected to the drains of said first and second transistors, respectively.

4,812,781

VARIABLE GAIN AMPLIFIER

Gerard S. Regnier, Scotts Valley, Calif., assignor to Silicon General, Inc., San Jose, Calif.

Filed Dec. 7, 1987, Ser. No. 129,746

Int. Cl.[4] H03F *3/45*

U.S. Cl. 330—254 **17 Claims**

1. A differential variable gain transconductance amplifier including in combination:

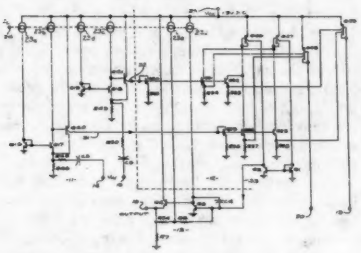
a differential voltage input stage including positive and negative inputs, two voltage-to-current converters and first and second outputs, with one converter being coupled to said positive input and the other converter being coupled to said negative input and with said two converters being of substantially identical structure, for producing two current outputs at said first and second outputs, respectively, with one of said two current outputs being of the same polarity and opposite in phase to the other one, responsive to voltage applied across said positive and negative inputs;

means for connecting a differential voltage across said positive and negative inputs of said differential voltage input stage;

a current summing stage including a first pair of current inputs, a second pair of current inputs, a current output, a plurality of current mirrors, and means for summation of opposite but equal currents cancelling to produce attenuated gain at said current output;

means for connecting said two outputs of said differential input stage to corresponding ones of said first pair of summing stage current inputs for applying current from said respective differential input stage outputs to said current summing stage;

means for connecting a differential current source to said second pair of summing stage inputs as complimentary current sources to provide a control current to said current summing stage;



said current summing stage being responsive to input current having a characteristic waveshape applied at said first pair of current summing stage inputs and further responsive to said control current inputted to said second pair of current summing stage inputs for producing an output current of a magnitude dependent upon said control current and of a waveshape that essentially replicates the wave shape of said voltage to current converters output currents as presented to said first pair of current inputs; and

an output stage having said summing stage current output as an input for converting current into voltage and producing a voltage output that essentially replicates the shape of said differential voltage applied to said differential voltage input stage.

4,812,782

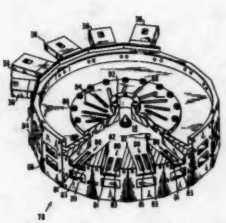
NON-REACTIVE RADIAL LINE POWER DIVIDER/COMBINER WITH INTEGRAL MODE FILTERS

James S. Ajioka, Fullerton, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 783,593, Oct. 3, 1985, abandoned. This application Aug. 31, 1987, Ser. No. 91,313

Int. Cl.[4] H03F *3/60*; H03H *7/48*

U.S. Cl. 330—286 **33 Claims**



15. A radial line power divider/combiner operating in a circumferential mode m, where the absolute value of m is a value of at least one comprising:

a first radial transmission line for dividing applied energy

comprising first and second electrically conductive plates spaced from each other by less than half of the wavelength of the input energy in a parallel relation, the first plate comprising a first port centrally located therein through which the input energy is applied;

first feed means at said first port for launching the applied energy in said mode m into the first radial transmission line causing current flow in said first radial transmission line in lines tangential to a mode cut off circle of m wavelengths in circumference, said current flow lines extending from said circumference to the periphery of said plates, said mode cut off circle having its center in said port;

a second radial transmission line for combining energy comprising third and fourth electrical conductive plates spaced from each other by no more than half the wavelength of the input energy in a parallel relation, the third circular plate comprising a second port centrally located therein through which the combined energy is output;

second feed means at said second port for receiving and combining energy in said mode m from the second radial transmission line, having current flowing therein in lines tangential to a mode cut off circle of m wavelengths in circumference, said current flow lines extending to said circumference from the periphery of said plates, said mode cut off circle having its center in said second port, and for linearly polarizing the received energy;

processing means for processing energy received from the first radial transmission line at its periphery and applying the processed energy to the second radial transmission line at its periphery;

at least one slot formed in at least one of said parallel plates in each of the radial transmission lines, said slots each having longitudinal centerlines which are parallel to at least one current flow line of the m circumferential mode energy in the respective radial transmission line;

whereby said at least one slot in the first radial transmission line suppresses modes other than m from the energy output of the radial transmission line and the at least one slot in the second radial transmission line suppresses modes other than m from the energy combined at said second port in the second radial transmission line.

4,812,783

PHASE LOCKED LOOP CIRCUIT WITH QUICKLY RECOVERABLE STABILITY

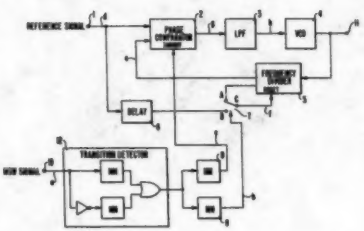
Masahiro Honjo, Neyagawa; Akihiro Takeuchi, Ikoma; Atsuo Ochi, Kadoma; Shinichi Aki, Osaka; Yukio Nakagawa, Moriguchi, and Masaaki Kobayashi, Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 24, 1987, Ser. No. 88,218

Claims priority, application Japan, Aug. 26, 1986, 61-199640; Sep. 22, 1986, 61-224457; Sep. 22, 1986, 61-224458

Int. Cl.[4] H04N *5/06*

U.S. Cl. 331—20 **3 Claims**



1. A phase locked loop circuit comprising:

a voltage-controlled oscillator oscillating at a frequency corresponding to a voltage applied thereto;

a frequency divider for dividing the oscillation frequency of the voltage-controlled oscillator;

a phase comparator for comparing phases of a reference signal inputted to the PLL circuit and an output signal of the frequency divider;

a low-pass filter for converting a phase comparison result of the phase comparator to a voltage for controlling the voltage-controlled oscillator;

first control means responsive to a discontinuous phase change of the reference signal for preventing a phase change of the reference signal from being transmitted through the low-pass filter to the voltage-controlled oscillator during a predetermined period; and

second control means responsive to the discontinuous phase change of the reference signal for forcedly pulling-in the phase of the PLL circuit so that the phase of the output signal of the frequency divider is locked to a new phase of the reference signal after the discontinuous phase change during a predetermined period.

4,812,784

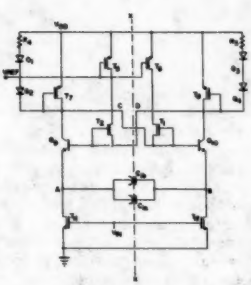
TEMPERATURE STABLE VOLTAGE CONTROLLED OSCILLATOR WITH SUPER LINEAR WIDE FREQUENCY RANGE

Paul W. Chung, and Paik Saber, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 19, 1987, Ser. No. 123,024

Int. Cl.[4] H03K *3/281*

U.S. Cl. 331—113 R **9 Claims**



1. A voltage controlled oscillator having high temperature stability, comprising:

a bipolar type means for switching a multivibrator;

a FET type current source coupled to said bipolar type switching means for compensating temperature fluctuations of said bipolar type means;

resistive means coupled to said bipolar type means for regulating its current to provide a linear frequency vs. voltage relationship; and

a plurality of diodes coupled to said resistive means for regulating the current through said resistive means.

4,812,785

GYRATOR CIRCUIT SIMULATING AN INDUCTANCE AND USE THEREOF AS A FILTER OR OSCILLATOR

Vlad Pauker, Bievres, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 24, 1987, Ser. No. 77,572

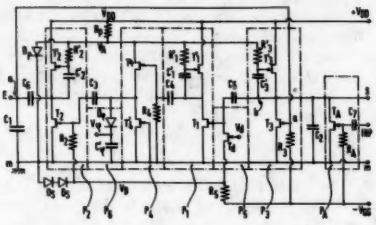
Claims priority, application France, Jul. 30, 1986, 86 11032

Int. Cl.[4] H03B *5/24;* **H03H** *11/08*

U.S. Cl. 331—117 FE **14 Claims**

1. A gyrator circuit comprising a first and a second transconductance amplifier A and B respectively having opposite conductances, which amplifiers are arranged in parallel between a

first terminal a and a second terminal b and comprises a first capacitance C_1 arranged between said first terminal a and a third terminal m, which gyrator circuit simulates an inductance L_g arranged between said second terminal b and said third terminal m and comprises means for controlling the quality factor Q of said inductance, characterized in that the first transconductance amplifier A comprises two inverting



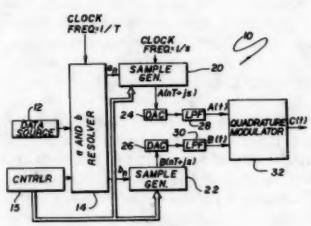
amplifier stages P_1 and P_2 arranged in series, in that the second transconductance amplifier B comprises an inverting amplifier stage P_3 and in that the means for controlling the quality factor Q comprises a first means P_5 for influencing an output conductance g_2 of the gyrator and a second means P_6 for influencing the phase shift ϕ between an output current and a gyrator control voltage.

4,812,786

METHOD AND SYSTEM FOR PROVIDING PRECISE MULTI-FUNCTION MODULATION

Faramaz Davarian, Los Angeles, and Joe T. Sumida, Altadena, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Sep. 28, 1987, Ser. No. 100,991
Int. Cl.[4] H03C 5/00; H04L 27/12, 27/20
U.S. Cl. 332—16 R **32 Claims**



1. A method for providing a modulation signal for a communication system in response to an input signal from a data source, said method including the steps of:

providing a digitized time response from samples of time domain representation of a spectrum profile of a selected modulation scheme;

generating and storing a coefficient for each input symbol in accordance with said selected modulation scheme; and

generating samples of an output signal, each sample being generated by:

multiplying a predetermined number of said coefficients by a predetermined number of samples of said digitized time response to provide a number of products; and

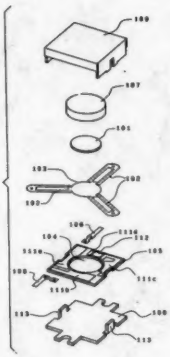
summing said products to provide one of said samples of said output signal.

4,812,787

LUMPED CONSTANT NON-RECIPROCAL CIRCUIT ELEMENT

Kenji Kuramoto, and Manabu Yumoto, both of Tottori, Japan, assignors to Nippon Ferrite, Ltd., Japan

Filed Oct. 20, 1987, Ser. No. 110,342
Claims priority, application Japan, Oct. 23, 1986, 61-253401
Int. Cl.[4] H01P 1/387
U.S. Cl. 333—1.1 **3 Claims**



1. A lumped constant non-reciprocal circuit element comprising a set of mutually insulated central conductors, only a single garnet plate not more than 0.6 mm in thickness, a ceramic substrate having a central bore and a planar surface with patterned electrodes formed thereon, said set of mutually insulated central conductors being positioned within said central bore, and a permanent magnet positioned proximate said garnet plate for applying a DC magnetic field to said garnet plate,

wherein each of said mutually insulated central conductors is folded to wrappingly enclose said garnet plate when received in the central bore of said ceramic substrate, and wherein said substrate is further provided with a plurality of terminals connected to said patterned electrodes to which terminal portions of the central conductor are operatively connected.

4,812,788

WAVEGUIDE MATRIX INCLUDING IN-PLANE CROSSOVER

Mon N. Wong, Torrance; Robert J. Patin, Hawthorne; Theodore S. Fishkin, Lawndale, and Donald C. D. Chang, Thousand Oaks, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 2, 1987, Ser. No. 115,952
Int. Cl.[4] H01P 5/18
U.S. Cl. 333—113 **10 Claims**

1. A matrix of conductors of electromagnetic power between a first set of ports and a second set of ports comprising:

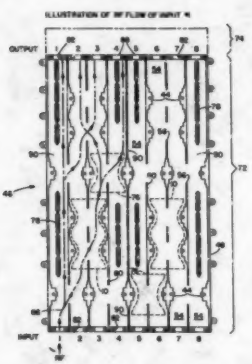
a top wall and a bottom wall, each of said walls extending in a longitudinal direction and in a transverse direction;

a set of divider walls extending from said top wall to said bottom wall, said divider walls extending in said longitudinal direction, individual ones of said divider walls being spaced apart from each other in said transverse direction to define a set of waveguides interconnecting said first set of ports with said second set of ports for coupling electromagnetic power therebetween, said divider walls serving as sidewalls of said waveguides, each of said waveguides connecting one port of said first set of ports with a corresponding port of said second set of ports;

a plurality of coupling means disposed at said sidewalls, each of said coupling means coupling a fraction of the power in

one waveguide past a divider wall to an adjacent waveguide; and wherein

said coupling means are arranged singly and in pairs along selected ones of said waveguides, a pair of said coupling means being two successive coupling means located at a single one of said sidewalls; and



each of said pairs of said coupling means form a crossover for crossing the total electromagnetic power from one waveguide through a divider wall into an adjacent waveguide, a plurality of said crossovers and a plurality of said singly-arranged coupling means providing for a distribution of electromagnetic power form a port of said first set of ports among a plurality of ports of said second set of ports.

4,812,789

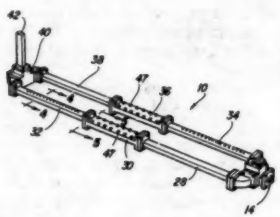
RIDGED WAVEGUIDE WIDE BAND DIPLEXER WITH EXTREMELY SHARP CUT-OFF PROPERTIES

Kuan M. Lee, Brea, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 107,000, Oct. 5, 1987, abandoned, which is a continuation of Ser. No. 811,597, Dec. 19, 1985, abandoned. This application Jan. 20, 1988, Ser. No. 146,018

Int. Cl.[4] H01P *1/213, 1/209, 1/207, 1/18*

U.S. Cl. 333—135 **26 Claims**



1. A wideband diplexer having a sharp frequency cut-off for separating an incoming wideband microwave frequency signal into upper and lower frequency bands, comprising:

means for splitting said incoming signal into a first output signal having only said lower band of frequencies and into first and second intermediate signals each having both said upper and lower bands of frequencies and possessing essentially equal energy;

a pair of waveguide assembies for respectively removing the frequencies in said lower band from said first and second intermediate signals, each of said waveguide assemblies including:

(1) a first ridged waveguide tuned for shifting the phase of the lower frequency band, wherein said first ridged waveguide includes an elongate hollow waveguide body defining a waveguide cavity, said body having a pair of opposing ridges within said cavity, and a plurality of longitudinally spaced tuning elements extending through said ridges and into said cavity,

(2) a second ridged waveguide for filtering out the lower frequency band; and

means coupled with said waveguide assemblies for combining the filtered intermediate signals and having an output for delivering a second output signal having only said upper band of frequencies.

4,812,790

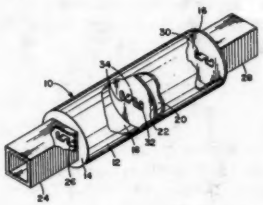
TOOTHED COUPLING IRIS

Paul J. Tatomir, Torrance, and Martin B. Hammond, Glendora, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 16, 1988, Ser. No. 155,906

Int. Cl.[4] H01P *1/208, 5/00*

U.S. Cl. 333—212 **9 Claims**



1. A microwave circuit having a plurality of enclosures configured for sustaining electromagnetic waves, said circuit comprising:

a wall separating two of said enclosures; and

an iris disposed in said wall, said iris being formed as an elongated aperture extending in a first direction along said wall to define a first long side and a second long side opposite said first long side; and wherein

at least a portion of said wall is configured as a plurality of teeth directed into said aperture and arranged in two arrays, one of said two arrays being located on said first side and the second of said two arrays being located on said second side of said aperture, said first array having one more tooth than said second array; and

said teeth forming a part of a periphery of the iris, the teeth introducing increased coupling of electromagnetic power via said iris through said wall.

4,812,791

DIELECTRIC RESONATOR FOR MICROWAVE BAND

Mitsuo Makimoto, and Motoi Ohba, both of Yokohama, Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Feb. 18, 1987, Ser. No. 16,086

Claims priority, application Japan, Feb. 18, 1986, 61-34622; Feb. 26, 1986, 61-41220; Mar. 12, 1986, 61-54055

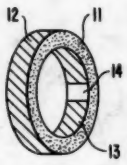
Int. Cl.[4] H01P *7/08, 7/10, 7/00*

U.S. Cl. 333—219 **13 Claims**

1. A dielectric resonator for the microwave band, said resonator comprising:

a dielectric member having a closed tubular shape comprising inner and outer circumferential surfaces and flat end surfaces;

a resonant line conductor disposed on one of said flat end surfaces of the dielectric member; and



a grounding conductor disposed on the other of said flat end surface of the dielectric member.

4,812,792

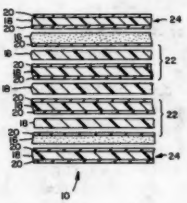
HIGH-FREQUENCY MULTILAYER PRINTED CIRCUIT BOARD

Joseph D. Leibowitz, Culver City, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 817,327, Jan. 9, 1986, Pat. No. 4,689,110, which is a division of Ser. No. 564,952, Dec. 22, 1983, Pat. No. 4,591,659. This application May 1, 1987, Ser. No. 44,689

Int. Cl.[4] H01P *3/08*; H05K *3/06*

U.S. Cl. 333—238 **18 Claims**



1. A high-frequency multilayer printed circuit, comprising:

a plurality of layers of a conductive metal;

a plurality of layers of graphite, at least some of which are positioned in close proximity to some of the layers of conductive metal to provide a relatively low resistance path for the flow of heat from the layers of conductive metal; and

a plurality of layers of a dielectric material;

wherein the layers are bonded together to form a composite multilayer printed circuit board, the layers of graphite being positioned in a symmetrical manner with respect to the thickness of the circuit board and selected in number to provide a multilayer circuit board having a desired coefficient of thermal expansion;

and wherein some of the layers of conductive metal are appropriately patterned and combined with other layers of conductive metal and layers of dielectric material to form one or more strip or microstrip transmission lines for electrically connecting very high frequency electronic components mounted on the board.

4,812,793

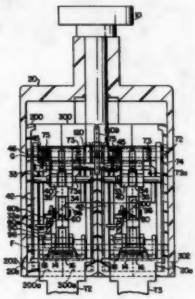
CIRCUIT BREAKER HOUSING WITH CENTERED ACTUATOR

Bohdan Krasij, Avon, Conn., assignor to Carlingswitch, Inc., West Hartford, Conn.

Filed Feb. 3, 1988, Ser. No. 151,927

Int. Cl.[4] H01H *75/00, 77/00, 83/00*

U.S. Cl. 335—8 **18 Claims**



1. A circuit breaker including a circuit breaker mechanism and a molded plastic housing, said housing comprising at least two half sections adapted for assembly in mating relationship to one another to define at least one chamber for at least one circuit breaker mechanism, said assembled half sections cooperating with one another to define a generally rectangular parallelpiped with a bottom wall having aligned slots to receive terminals for the breaker switching mechanism, said slots defined in part by each of said two mating half sections, said half sections having portions abutting one another to define end walls and having spaced parallel side walls with openings to receive the ends of at least one cross shaft in said circuit breaker switch mechanism in order to locate the mechanism in said chamber, said half sections cooperating to define an open top, said housing also including an outer shell surrounding the assembled half sections and having side walls overlying said half section side walls and end walls overlying said abutting half section end walls so that said outer shell prevents separation of said assembled half sections, said outer shell having a top overlying said open top of said assembled half sections, an actuator for manually operating said breaker mechanism, said outer shell having a top opening to receive said actuator, and means for securing said half sections in assembled relationship with said outer shell, said means defined in part by said half sections side walls and in part by said outer shell side walls.

4,812,794

ELECTRICAL RELAY APPARATUS

Walter E. Asbell, Westerville, and Michael L. Thieken, Glenford, both of Ohio, assignors to American Telephone & Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 17, 1987, Ser. No. 15,714

Int. Cl.[4] H01H *1/66, 51/01*

U.S. Cl. 335—151 **11 Claims**

1. A relay (1) having terminal means (15) comprising

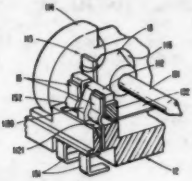
a contact assembly (13) for selectively establishing electrical paths between the terminal means

Characterized in That

said relay comprises

means (11, 12) for slidably receiving ones of the terminal

means and wedging said slidably received using wedge-shaped members (1121) to engage ones of the terminal



means in said slidably receiving m in locked electrical engagement with the contact assembly.

4,812,795

ELECTROMAGNETIC DEVICES HAVING SELECTIVELY MOVABLE CORE WINDING

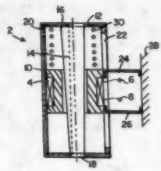
Nachum Zabar, 4 Ravon Street, Givat Savion, Ganeh Tikvah, Israel

Filed Apr. 29, 1987, Ser. No. 43,764

Claims priority, application Israel, May 2, 1986, 78863; Sep. 29, 1986, 80173

Int. Cl.[4] H01F *7/08*

U.S. Cl. 335—258 **11 Claims**



1. An electromagnetic actuable device comprising:

at least one current carrying winding member having electrical terminals for applying voltage thereacross; and

a ferromagnetic member configured to provide a closed magnetic flux path for magnetic flux induced by the winding member being at least in proximity to said winding member for modifying the magnetic field intensity therethrough;

one of said members being adapted to be immobilized with respect to the other member so that upon the application of voltage to said winding member the non-immobilized member is movable with respect to the other member in response to the force developed by said induced flux in interacting with said ferromagnetic member to produce a non-uniform distribution of flux density along said ferromagnetic member.

4,812,796

QUENCH PROPAGATION DEVICE FOR A SUPERCONDUCTING MAGNET

Guenter Ries, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 25, 1988, Ser. No. 173,672

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1987, 3710519

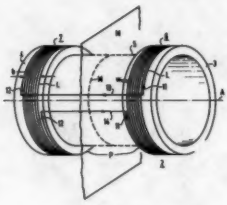
Int. Cl.[4] H01F *5/00*

U.S. Cl. 335—299 **15 Claims**

1. An apparatus comprising:

a first pair of superconducting coils; and

a pair of auxiliary windings, each auxiliary winding being closely magnetically coupled to one of said first pair of superconducting coils and comprising a discrete conductor of normal-conducting material having a predetermined specific electrical resistance, with the auxiliary windings assigned to the coils of the coil pair short-circuited with each other so that the direction of current flow in one auxiliary winding is opposite to the direction of current flow in the second auxiliary winding.



4,812,797

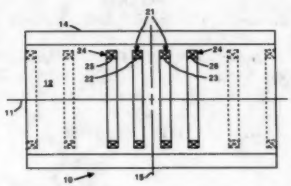
COMPENSATION COIL FOR TEMPORAL DRIFT OF A SUPERCONDUCTING MAGNET

Raghavan Jayakumar, Florence, S.C., assignor to General Electric Company, Milwaukee, Wis.

Filed Mar. 22, 1988, Ser. No. 171,824

Int. Cl.[4] H01F *5/00*

U.S. Cl. 335—299 **7 Claims**



1. A coil assembly for an NMR imaging system comprising:

a main coil means for producing a magnetic field within a region;

a correction coil means for correcting spatial inhomogeneity in the magnetic field produced by said main coil means, said correction coil means being inductively coupled to said main coil means; and

a compensation coil means inductively coupled to said main coil means so that temporal decay of the main coil current produces a magnetic field harmonic component from said compensation coil means that is opposed to a magnetic field harmonic component produced by the correction coil due to the decay.

4,812,798

ELECTRIC TRANSFORMER FOR MICROWAVE OVENS

Bernard Chappel, Albertville, France, assignor to Societe Pour L'Application De L'Optique et de L'Electronique a la Recherche et a L'Automatisation Optelec, Albertville, France

Filed May 9, 1988, Ser. No. 191,563

Claims priority, application France, May 11, 1987, 87 06927

Int. Cl.[4] H01F *27/02, 27/30*

U.S. Cl. 336—98 **10 Claims**

1. In a transformer for microwave ovens including:

a main primary electric winding, in the form of a coil,

a main secondary high electric voltage winding in coil form,

a secondary electric heating winding in coil form,

a magnetic circuit with two lateral columns and a central column all three connected together by end cross pieces and by an intermediate magnetic shunt, the electric windings being disposed about the central column, the mag-

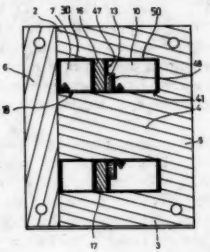
netic shunt being disposed between the primary winding and the secondary high voltage winding,

electric insulating means between the primary and secondary windings and between the electric windings and the magnetic circuit,

electric connection means for connecting the ends of the electric windings to external electric circuits.

a primary carcase made from an insulating material, comprising a central former for the passage of the central magnetic circuit column, and an external flange and an internal flange,

a secondary carcase made from an insulating material, including a central former for the passage of the central



magnetic circuit column, an external flange and an internal flange, said insulating means include:

two primary insulating covers, each having three walls, covering respectively the external and internal flanges, and the electric winding in the zones facing the magnetic circuit,

two secondary insulating covers, each having three walls, covering respectively the external and internal flanges and the electric winding in the zones facing the magnetic circuit,

an external annular housing formed in one of the internal flanges and containing the secondary electric heating winding, thus ensuring its electric insulation and its mechanical securing.

4,812,799

MINIATURE CIRCUIT BREAKER WITH IMPROVED LONGEVITY

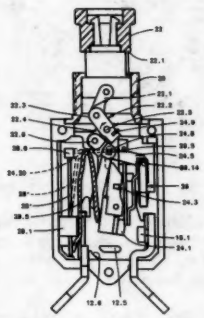
Carleton M. Cobb, III, East Walpole; Hans G. Hirsbrunner, Attleboro; Edward M. Gonsalves, Swansea; Richard L. Jenne, Attleboro, all of Mass., and Sepideh H. Nott, Portsmouth, R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 34,174, Apr. 2, 1987. This application Feb. 26, 1988, Ser. No. 160,792

Int. Cl.[4] H01H *71/16*

U.S. Cl. 337—70 **2 Claims**

1. A switching device comprising a housing defining therein a chamber, stationary contact means mounted in the chamber, movable contact means disposed in the chamber adapted to move into and out of engagement with the stationary contact means, actuation means extending from outside the housing into the chamber coupled to the movable contact means adapted to move the movable contact means, latching means disposed in the chamber adapted to maintain the stationary and movable contact means in engagement during preselected conditions, a cantilevered bimetallic current carrying assembly having one end fixedly supported in the housing and having a second distal end portion adapted to deflect upon being subjected to selected current conditions, the distal end portion of the bimetallic assembly operatively connected to a reaction surface of the latching means, the latching means including a latch surface operatively connected to the actuating means adapted to engage the reaction surface when the bimetallic assembly is at normal operating temperature upon actuation of the actuator means, a support member rockably mounted in the housing and mounting the reaction surface, a bracket being attached to the support member, the bracket having a portion spaced from the support member culminating in a free end, an ambient compensating strip of bimetallic material being cantilever mounted to the free end, the strip having a distal free end, a motion transfer member extending between the second distal end portion of the bimetallic current carrying assembly and the distal free end of the ambient compensating strip and being



adapted to transfer motion therebetween, the bimetallic current carrying assembly being formed into a plurality of loops extending between the one end and the distal end portion and the distal end portion being disposed without additional fastening means in a block of electrically insulative high temperature resinous material to maintain the distal end portion of the loops aligned with one another so that upon being subjected to selected current conditions deflection of the distal end of the bimetallic assembly will cause the movable contact means to become unlatched.

4,812,800

STRAIN GAGE HAVING A THIN DISCONTINUOUS METAL LAYER

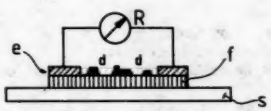
Harald Fuchs, Gruenstadt; Herbert Gleiter, Saarbruecken; Stephan Trapp, Meschweiler, and Juergen Petermann, Buxtehude, all of Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 5, 1987, Ser. No. 10,995

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1986, 3603449

Int. Cl.[4] G01L *1/22*

U.S. Cl. 338—2 **10 Claims**



1. A tunnel strain gage possessing a thin discontinuous metal layer which changes its electrical resistance with strain, wherein the said strain gage

(a) contains a thin discontinuous metal layer whose conduction effect is based predominantly on the tunnel effect and which is

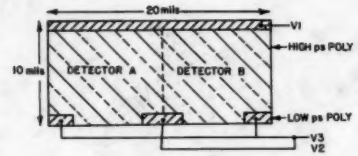
(b) applied uniformly to a thin, nonmetallic, dielectric or semiconducting substrate, the diffusion processes in the applied metal layer being reduced by interaction between the substrate and the metal layer.

4,812,801

SOLID STATE GAS PRESSURE SENSOR

James Halvis, Arnold; Nathan Bluzer, Silver Spring, and Robert Shiskowski, Columbia, all of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 14, 1987, Ser. No. 49,363
Int. Cl.[4] G01L *1/22*
U.S. Cl. 338—4 **2 Claims**



1. A solid state gas pressure sensor, said gas pressure sensor comprising:

a means for producing heat in response to current flow at a fixed voltage such that said current flow changes as a direct result of changing gas density thereabout, said means for producing heat being an integrated circuit device,

a non-flexing means for holding said means for producing heat, said non-flexing means being an electrical insulator and a thermal barrier, said non-flexing means being mounted on a housing, and

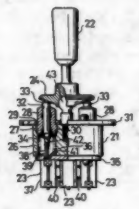
electrical contacts, said electrical contacts attached to said means for producing heat.

4,812,802

JOY STICK

Kenichi Nishiumi, and Hideomi Watanabe, both of Sagamihara, Japan, assignors to Kayaba Kogyo Kabushiki Kaisha, Japan

Filed Nov. 6, 1987, Ser. No. 118,391
Int. Cl.[4] H01C *10/16*
U.S. Cl. 338—128 **5 Claims**



1. A joy stick comprising:

a housing having an upper surface;

a ball joint mounted in the center of said housing upper surface;

a lever having a ball joint receiving portion engaging said ball joint and a pressing part extending radially outwardly about the periphery of said ball joint receiving portion;

a plurality of push rods slidably mounted with respect to said housing for vertical movement, each of said push rods having an upper end which is engageable with said pressing part of said operating lever;

a plurality of potentiometer housings corresponding in number to said plurality of push rods, each potentiometer housing being mounted on a lower portion of said housing substantially in axial alignment with a respective one of said push rods;

a plurality of potentiometers, each of said pluraltiy of potentiometers being positioned in a respective one of said potentiometer housings, each of said potentiometers and said potentiometer housings being equally spaced about said housing;

a plurality of potentiometer slider elements, each slider element being in operative engagement with a respective one of said potentiometers and adapted to move vertically between a lowermost position and an uppermost position, each of said potentiometers being linear and having a zero voltage output when a respective slider element is in its uppermost position, each of said slider elements being in axial alignment with a respective one of said plurality of push rods, each of said slider elements having a top end portion adapted to engage a bottom portion of said push rods;

a plurality of first spring elements, each of said first spring elements being positioned in said housing and in engagement with a bottom portion of a respective one of said push rods for urging the corresponding push rod vertically upwardly into engagement with said pressing part; and

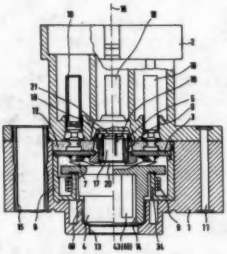
a plurality of second spring members each of said second spring members being positioned in said housing and engageable with a top end portion of a respective one of said slider elements to urge each of said slider elements into engagement with the respective bottom portion of a push rod and to urge each of said slider elements into its uppermost position.

4,812,803

ROTARY POTENTIOMETER, ESPECIALLY FOR USE AS A ROTATIONAL POSITION SENSOR TO DETECT THE ANGULAR POSITION OF A SHAFT

Reinhard Hochholzer, Hohenkirchen, Fed. Rep. of Germany, assignor to Wilhelm Ruf A.G., Hoenkirchen, Fed. Rep. of Germany

Filed Jul. 8, 1987, Ser. No. 71,090
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1986, 3624640
Int. Cl.[4] H01C *10/34*
U.S. Cl. 338—175 **12 Claims**



1. A rotary potentiometer adapted to receive and sense the rotational position of a shaft, the potentiometer having a first axis of rotation, the shaft having a second axis of rotation, said first and second axis being nominally aligned, said potentiometer and said shaft being subject to relative movement at which these axes exhibit relatively small misalignments, said potentiometer comprising:

a casing having a central opening for receiving said shaft, the opening having an axis defining said first axis, the shaft having an axis defining the second axis;

a resistor support held in fixed position within the casing, said support having an electrical resistance layer;

a spring carrier adapted to be coupled to said shaft and disposed in the casing, said carrier being rotatable about a

third axis, which when the shaft is not received in the opening is aligned with the first axis;

a slider spring fastened in the casing at the spring carrier and being in sliding contact with said layer; and

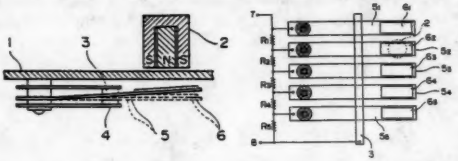
means disposed in the casing for coupling said carrier to said shaft in a connection at which when said first and second axis of rotation are relatively misaligned, the casing will pivot so that its third axis will intersect the second axis and define a small angle therewith, whereby contact pressure exerted by the spring upon the support remains essentially constant in the presence and absence of said misalignment.

4,812,804

CONTROLLER FOR ELECTRIC DEVICES DIRECTED TO USE IN BATH

Kazumi Masaki, Osaka, Japan, assignor to Ken Hayashibara, Okayama, Japan

Filed Sep. 1, 1987, Ser. No. 92,403
Claims priority, application Japan, Sep. 9, 1986, 61-138372[U]
Int. Cl.[4] H01C *10/50*
U.S. Cl. 338—200 **10 Claims**



1. A controller for electric devices directed to use in bath, comprising:

a plurality of switching means provided in parallel to leave appropriate spacings between adjoining switching means, each switching means comprising at least one fixed piece, and a movable piece having a magnetic body faced with said fixed piece to leave an appropriate spacing;

a container hermetically enclosing said plurality of switching means; and

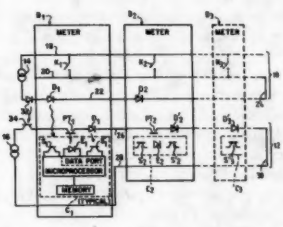
a magnet movably provided outside said container in such manner that, when said magnet moves along said plurality of switching means, the attractive or repulsive force successively brings the movable pieces into contact with their corresponding fixed piece.

4,812,805

SYSTEM FOR INTERCONNECTING PARKING METERS HAVING A MEMORY

Claude Lachat, and Joëlle Ferrus, both of Besancon, France, assignors to Flonic, Montrouge, France

Filed Jul. 2, 1986, Ser. No. 881,450
Claims priority, application France, Jul. 2, 1985, 85 10058
Int. Cl.[4] G08C *19/06*
U.S. Cl. 340—825.05 **10 Claims**



1. A system of interconnecting a plurality of machines together for information transmission, each machine including a processor circuit and a memory for storing information, the system comprising:

connection means for connecting said machines to one another, said connection means including seizure circuit means responsive to an operating condition of said machines for causing said processor circuit and said memory in other machines in said system to be activated;

transmission means for transmitting information stored in the memory of at least a first of said machines over said connection means to at least one other of said machines for storage in a memory of at least one other of said machines, said transmission means including means at each machine for transmitting said information substantially upon its appearance at each machine, said information being transmitted to all of the other machines; and

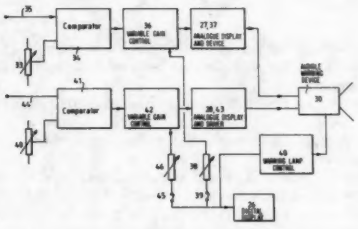
means for interrupting transmission by said transmission means once said information from at least said first of said machines has been transmitted.

4,812,806

VEHICLE AND METHOD OF INDICATING ATTAINMENT OF MAXIMUM AXLE LOAD

John W. H. Freeman, 21 Cryers Oak Close, Solihull, West Midlands, United Kingdom B90 4UW

Filed Jul. 31, 1987, Ser. No. 80,315
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 340—440 **6 Claims**



1. A method of indicating to a user of a wheeled road vehicle attainment of a prescribed maximum axle load on an axle of the vehicle comprising the steps of:

(a) mounting on the vehicle an indicator responsive to a predetermined indication signal to provide to the user a maximum load signal,

(b) mounting in a fixed position with respect to a chassis of the vehicle a transducer which provides an output signal representing movement of an input element of the transducer relative to a body of the transducer,

(c) mechanically connecting the input element of the transducer to a member of the vehicle relative to which the vehicle chassis moves when a suspension of the vehicle deflects under load, whereby the input element is moved relative to the body of the transducer by an amount representing a deflection of the suspension,

(d) providing a reference signal,

(e) comparing the output signal with the reference signal and providing said predetermined indication signal to the indicator when the output signal bears a predetermined relation to the reference signal,

(f) subjecting the vehicle to a maximum load which imposes on the axle said prescribed load,

(g) whilst the vehicle is subjected to said maximum load, varying the reference signal until the output signal bears said predetermined relation to the reference signal and said predetermined indication signal is therefore provided to the indicator,

(h) relieving the vehicle of said maximum load, and

(i) during subsequent loading of the vehicle, providing the reference signal without variation thereof, comparing the

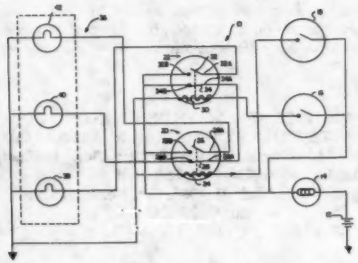
output signal with the reference signal and, whenever the output signal bears said predetermined relation to the reference signal, providing the indication signal to the indicator to cause the indicator to provide the maximum load signal to the user.

4,812,807

VEHICLE MOTION INDICATOR

Jesse F. Davis, 2737 11th Ave., Port Arthur, Tex. 77642, and John C. Prevost, Rte. 3 Box 259A, Buna, both of Tex. 77612

Filed Nov. 23, 1987, Ser. No. 130,271
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 340—464 **6 Claims**



1. A vehicle motion indicating device including:
a first light for providing an indication that the vehicle is stopping;
a second light for providing an indication that the vehicle is accelerating;
a third light for providing an indication that the vehicle is decelerating;
means for activating the first, second and third lights;
a first means, including a first switch, for coupling the light activating means to the first light and for enabling the activation of the the first light upon closing of the switch to thereby provide a indiction that the vehicle is stopping;
a second means, including a first switch, for coupling the light activating means to the second light and for enabling the activation of the second light upon closing of the switch to thereby provide an indication that the vehicle is accelerating ; and
a third means, including a pair of switches, one of the pair of switches being a second switch included in the first means and the other of the pair of switches being a second switch included in the second means which is coupled to the second switch in the first means, for coupling the light activating means to the third light and for enabling the activation of the third light upon closing of the pair of switches to thereby provide an indication that the vehicle is decelerating.

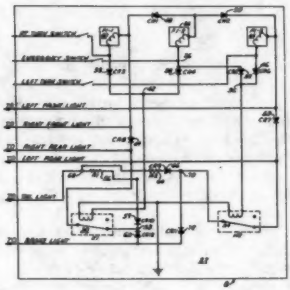
4,812,808

ELECTRONIC CONTROL MEANS AND IMPROVED METHOD FOR CONTROLLING LIGHTS

Larry F. Ulrich, Box 289, Garden City, Kans. 67846

Continuation-in-part of Ser. No. 731,987, May 8, 1985, Pat. No. 4,670,736. This application Apr. 13, 1987, Ser. No. 37,338
The portion of the term of this patent subsequent to Jun. 2, 2004, has been disclaimed.
Int. Cl.[4] B60Q *1/46*
U.S. Cl. 340—468 **20 Claims**

1. In a control system for lights including a storage battery means having two terminals, one terminal being connected to ground and another terminal connected to a flasher means, a left and right front signal lights and rear tail lights, a left and right front running lights, right rear and left rear brake lights, left and right turn signal and indicator lights, a left turn switch means connected between the storage battery means and the left turn signal and indicator lights, a right turn switch means attached between the storage battery means and the right turn signal and indicator lights, an emergency switch means connected between the storage battery means and the left-front signal light and left rear brake light and tail light and right front signal light and rear brake light and tail light, and a brake light switch means connected between the storage battery means and the left and right rear brake lights, an electronic control circuit comprising in combination,
an operating circuitry board;
an emergency circuitry means mounted on said operating circuitry board and in electrical communication with said battery means and said emergency switch means, said emergency switch means when activated causes the emergency circuitry means to send intermittent electrical power from the battery means to the left front signal light and rear brake lights and tail lights and right front signal light and rear brake lights and tail lights causing the same to flash on and off intermittently;
a right turn circuitry means mounted on said operating circuitry board and in electrical communication with said battery means and said right turn switch means, said right



turn switch means when activated causes the right turn circuitry means to send intermittent electrical power from the battery means to said right front signal light and turn indicator light;
a left turn circuitry means mounted on said operating circuitry board and in electrical communication with said battery means and said left turn switch means, said left turn switch means when activated causes the left turn circuitry means to send intermittent electrical power from the battery means to said left turn signal light and indicator light;
a brake light circuitry means mounted on said operating circuitry board and in electrical communication with said battery means and said brake light switch means, said brake light switch means when engaged causes the brake circuitry means to send electrical power from the battery means to said left and right rear brake lights;
a tail light circuitry means mounted on said operating circuitry board and in electrical communication with said battery means, said tail light circuitry means sends electrical power from the battery means to said left and right rear tail lights, left and right front running lights, and left and right rear brake lights.

4,812,809

CIRCUIT FOR CHECKING THE COINCIDENCE OF A DATA WORD WITH A REFERENCE DATA WORD

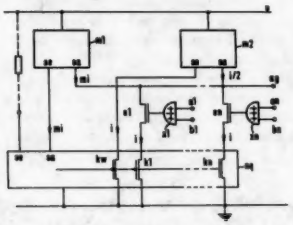
Paul O'Leary, Gundelfingen, and Hans-Josef Orben, Heuweiler, both of Fed. Rep. of Germany, assignors to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Mar. 23, 1987, Ser. No. 30,043

Claims priority, application European Pat. Off., Mar. 22, 1986, 86103945

Int. Cl.[4] G06F *7/02*

U.S. Cl. 340—146.2 **4 Claims**



1. A circuit for checking the coincidence of an input data word having a first plurality of digits with a reference data word also having said first plurality of digits, and for transmitting an active coincidence signal at an output thereof, said circuit being selectable as to the number of digits by which the input data word may deviate from the reference data word while continuing to provide said active coincidence signal, said circuit comprising:

an exclusive-OR (EXOR) gate for each of said first plurality of digits, each of said EXOR gates having a first input connected to receive a digit from said input data word and a second input connected to receive the corresponding digit from the reference data word;

a first switch transistor for each of said first plurality of digits, each of said switch transistors having a gate and a source-drain section, said source-drain section having a first end and a second end, the output of each of said EXOR gates being connected to the gate of a corresponding one of said first switch transistors to selectively activate said corresponding one of said first switch transistors when said digits applied to said first and second inputs of said EXOR gate differ, the first end of each of said first switch transistors being connected to said output of said circuit;

a first P-current mirror and a second P-current mirror, each having a current input and a current output, the respective current outputs of said first and second P-current mirrors being connected to the output of the circuit;

a multiple constant-current source comprising a second plurality of constant-current N-transistors, said second plurality of constant-current N-transistors comprising:

a first plurality of constant-current N-transistors corresponding to said first plurality of digits, each of said N-transistors having a source-drain section with a first end and a second end, each of said N-transistors being dimensioned to conduct a standard current, said first end of the source-drain section of each of said N-transistors being connected to the zero point of the circuit (ground), the second end of each of said source-drain section of each of said N-transistors connected to the second end of a respective one of said first switch transistors, said N-transistors operating to conduct a constant-current from said output of said circuit via said first set of switching transistors having a magnitude that varies in accordance with the number of digits by which said input data word differs from said reference data word;

an additional constant-current N-transistor having a source-drain section which conducts said standard current, said source-drain section having a first end and a second end, the first end being connected to said zero point of said circuit, the second end being connected to said current input of said second P-current mirror, said second P-current mirror responsive to said current input and providing a current on said output of said second P-current mirror equal to half said standard current; and

a variable current output connected to the current input of said first P-current mirror, said variable current output conducting a multiple of the standard current, said multiple corresponding to the number of digits by which said input data word may vary from said reference data word and said circuit continue to provide said active coincidence signal.

4,812,810

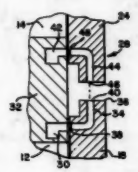
FIBER OPTIC DOOR SENSOR FOR A DOMESTIC APPLIANCE

Daniel S. Query, Antioch, Tenn., and Linda A. Zummer, Reims, France, assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 25, 1988, Ser. No. 148,382

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—545 **21 Claims**



1. A sensor for a domestic appliance used to determine the relative position of first and second structures of said appliance movable with respect to each other, said sensor comprising:

fiber optic means disposed in said appliance relative to said second structure for transmitting light impinging on a first end of said fiber optics means to a second end of said fiber optic means, said first end being disposed adjacent to said first structure; and

receiver means disposed in said appliance adjacent said second end of said fiber optic means for sensing light, said receiver means being responsive to light transmitted from said second end of said fiber optic means to detect a given position of said first structure relative to said second structure.

4,812,811

ALARM TAG

Leif Äsbrink, Vingåker, and Ulf Graflind, Sollentuna, both of Sweden, assignors to Intermodulation and Safety System AB, Sweden

PCT No. PCT/SE87/00028, § 371 Date Sep. 25, 1987, § 102(e) Date Sep. 25, 1987, PCT Pub. No. WO87/05136, PCT Pub. Date Aug. 27, 1987

PCT Filed Jan. 23, 1987, Ser. No. 104,869

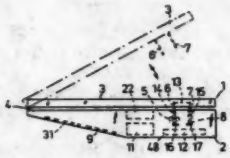
Claims priority, application Sweden, Feb. 13, 1986, 8600647

Int. Cl.[4] G08B *13/14*

U.S. Cl. 340—571 **6 Claims**

1. An alarm device, comprising a so-called alarm tag consisting of two parts arranged so as to be placeable each on one side of an article, for example an article of clothing, of fur or other article, where a needle is provided to extend from one part through the article to the second part, which alarm tag comprises means for receiving a magnetic alternating field emitted

to the alarm tag, which tag (1) comprises devices (8–12) capable to emit an acoustic signal when the parts (2,3) of the alarm tag (1) move away from each other when the alarm tag (1) is in a first, active, state and not to emit an acoustic signal when the parts (2,3) of the alarm tag (1) move away from each other when the alarm tag (1) is put in a second, inactive, state, said devices (8–12) comprising a switch (8), a coil (9), a detector circuit (10), a control circuit (11) and a loudspeaker (12), which devices are attached in the alarm tag (1) and are in operable communication with each other, where said switch (8) is capable when the parts of the alarm tag (1) move away from each other to open an electric circuit, and the control circuit (11) is capable to emit a signal to the loudspeaker (12) when the alarm tag (1) is put in said active state, characterized in that said



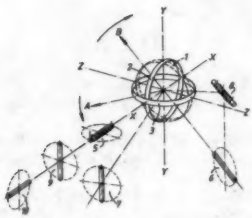
switch (8) comprises one or several needles (6,7), which needle or needles (6,7) in closed position of the alarm tag are arranged to form a closed electric circuit between the two parts (2,3) of the alarm tag, where said electric circuit is opened when said needle or needles (6,7) are moved away from one (2,3) or the other (3,2) part of the alarm tag, and in that one of said devices for putting the alarm tag in an inactive state comprises a receiving circuit comprising said coil (9) and a first detector circuit (10), where said receiving circuit is tuned to a magnetic alternating field of a first predetermined frequency (F1), and that the detector circuit (10) is capable to emit a signal to the control circuit (11) to put the alarm tag in the inactive state when an alternating field of said first predetermined frequency (F1) is detected.

4,812,812

APPARATUS AND METHOD FOR DETERMINING THE POSITION AND ORIENTATION OF A REMOTE OBJECT

Peter M. Flowerdew, and Donald L. Hore, both of Bristol, United Kingdom, assignors to Gas Research Institute, Inc., Chicago, Ill.

Filed Oct. 16, 1987, Ser. No. 109,550
Int. Cl.[4] G01V *1/00*
U.S. Cl. 340—854 **40 Claims**



1. An apparatus for determining the position and orientation of a remote object in relation to an observation point comprising

transmitting means for sending a magnetic field signal,

receiving means for receiving and analyzing said magnetic field signal,

one of said means being positioned at said observation point and the other being secured on said remote object,

said transmitting means comprising three coils positioned on a ferromagnetic core with their axes mutually orthogonal to each other,

a two-phase power source connected separately to each of said coils and operable when energized to produce a magnetic field around the coils,

electric means cooperable with said separate two-phase power sources for connecting said coils in pairs to produce a magnetic field rotating about the axis of the third coil,

said receiving means comprising three coils positioned on a ferromagnetic core with their axes mutually orthogonal to each other and responsive to the magnetic field produced by said transmitting means,

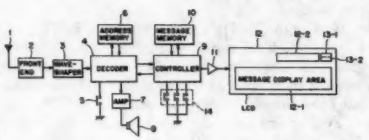
said receiving coils being connected in pairs to detect the phase relationship and magnitude of the signal induced by the transmitting coils to produce an electric signal indicative of the orientation of said remote body.

4,812,813

DISPLAY RADIO PAGER HAVING GRAPHIC ALARM FOR SELECTIVE INDICATION OF MEMORY AVAILABILITY FACTORS

Motoki Ide, and Toshifumi Sato, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 25, 1987, Ser. No. 89,110
Claims priority, application Japan, Aug. 25, 1986, 61-198708
Int. Cl.[4] H04Q *1/30*; G08B *5/22*
U.S. Cl. 340—311.1 **5 Claims**



1. A selective calling display radio pager adapted to receive a paging signal including a selective calling address and a message, comprising:

a detector means for detecting a calling address identifying the radio pager;

a memory for storing each of a plurality of said messages in response to the detection of said pager identifying calling address, said memory having a plurality of cells which are organized into a plurality of sectors for storing said messages and a plurality of directory cells respectively indicating entries of the messages stored in said sectors;

message display means for providing a display of each of said messages stored in said memory;

graphic alarm indicator means; and

means associated with said memory for determining whether said sectors or directory cells are a more accurate early warning indication against possible depletion of said memory and for providing a display of a quantity on said graphic alarm indicator means, said quantity indicating a degree of availability of said memory in terms of said determined sectors or directory cells.

4,812,814

INDICATING LIGHT

William Elliott, Zephyr Cove, Nev., assignor to Magnadyne Corporation, Compton, Calif.

Filed Jul. 21, 1988, Ser. No. 222,141
Int. Cl.[4] G08B *5/00*; H05B *33/00*
U.S. Cl. 340—332 **14 Claims**

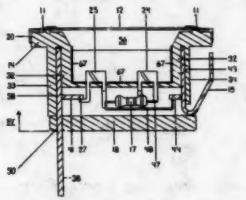
1. An indicating light comprising:

a main housing having a top and bottom portion with an

internal cavity in the bottom portion with an opening along the bottom of said cavity;

an LED unit having a box with a plurality of spaced LEDs therein mounted in said cavity, each of said LEDs having a contact extending out through said opening and below said cavity, each of said LEDs being interconnected by an electrically conductive element, said element also extending out through said opening below said cavity;

an elongated metallic contact mounted in said housing and extending away from the bottom portion thereof electrically connected to the contact of one of said LEDs;



a generally U-shaped metallic contact mounted in said housing having one leg electrically connected to one lead of a resistor mounted in the bottom portion of said housing below said cavity and the other leg extending out of said housing providing a ground for said light, said resistor having a second lead electrically connected to the contact of the other of said LEDs; and

a lens mounted in the top portion of said housing closing off the upper open end of said cavity.

4,812,815

DIGITAL-TO-ANALOG CONVERTER SYSTEM

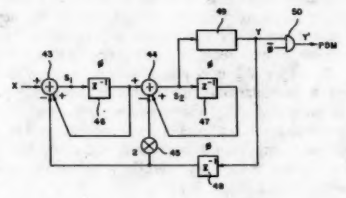
Kazumitsu Miyakoshi, Yamatokoriyama, and Mitsuyoshi Nakaya, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 24, 1986, Ser. No. 923,163

Claims priority, application Japan, Dec. 25, 1985, 60-298451; Apr. 21, 1986, 61-92960; May 26, 1986, 61-123034

Int. Cl.[4] H03M *1/00*

U.S. Cl. 455—612 **6 Claims**



1. A D/A converter system for converting a digital signal to an analog signal, comprising:

means for a receiving PCM (Pulse Coded Modulation) signal as a digital signal;

pulse density modulator means for converting the PCM signal received by said receiving means to a pulse density modulation signal; and

means for converting the pulse density modulation signal output from said pulse density modulator means to an analog signal;

said pulse density modulator means including,

a first memory having a first memory input and a first memory output;

a first adder adding said PCM signal and said first memory output and developing a first adder output, said first adder output being connected to said first memory input;

a second memory having a second memory input and a second memory output;

a second adder adding said first memory output and said second memory output and developing a second adder output, said second adder output being connected to said second memory input; and

positive/negative determination means, connected to the said second adder output, for developing said pulse density modulation signal related to the signal of said second adder output.

4,812,816

ELECTRONIC CIRCUIT WITH COMPLEMENTARY DATA LINE

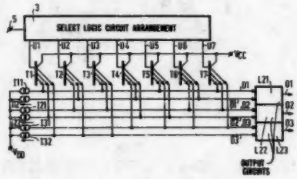
Robert E. J. van de Grift, and Martien van der Veen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 8, 1987, Ser. No. 94,224

Claims priority, application Netherlands, Sep. 11, 1986, 8602294

Int. Cl.[4] H03M *1/38*

U.S. Cl. 341—133 **3 Claims**



1. An electronic circuit arrangement comprising selection logic circuit means having an input and 2^n-1 outputs, a group of 2^n-1 multi-emitter bipolar transistors, each transistor having n emitters, said 2^n-1 selection logic circuit outputs being connected, respectively, to the bases of said 2^n-1 transistors, a group of n pairs of data lines, a current source connected to each data line, and an output circuit connected to each pair of data lines, said n emitters of each transistor being connected to said n pairs of data lines in such a manner that each pair of data lines always carries complementary logic signals during circuit operation.

4,812,817

DIFFERENTIAL ANALOG-DIGITAL CONVERTER WITH SWITCHED CAPACITORS

Patrick Bernard, Grenoble, France, assignor to Thomson Semiconducteurs, Paris, France

Filed Oct. 7, 1987, Ser. No. 105,280

Claims priority, application France, Oct. 7, 1986, 86 13935

Int. Cl.[4] H03K *13/02*

U.S. Cl. 341—172 **12 Claims**

1. An analog-digital converter comprising:

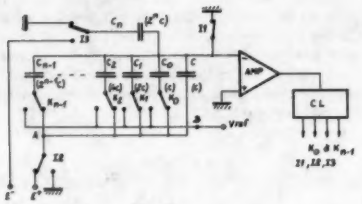
an input E+ and an input E−, as well as a ground, with an analog voltage to be converted being applied between the input E+ and the input E−;

a high-gain differential amplifier with a non-reversing input and a reversing input, said non-reversing input being connected to the ground;

a first change-over switch to connect the reversing input to the ground or to disconnect the reversing input from the ground;

a series of capacitors having values weighted according to a binaray sequence which ranges from a lowest-value capacitor to a highest-value capacitor all having a first terminal connected to the reversing input of the amplifier;

a series of change-over switches to connect a second terminal of each capacitor, except the one having the highest value, either to a first node of the circuit or to a second node, the second node being connected to a first reference potential;



a second change-over switch to connect the first node either to the input E+ or to a second reference potential; and

a third change-over switch to connect a second terminal of the highest value capacitor either to the input E− or to a third reference potential.

4,812,818

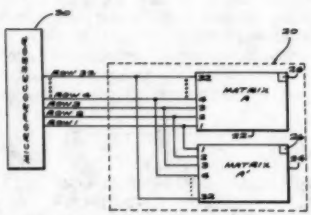
DIGITAL-TO-ANALOG CONVERTER

Joseph H. Colles, Oceanside, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Filed Feb. 24, 1987, Ser. No. 18,014

Int. Cl.[4] H03M *1/66*

U.S. Cl. 371—30 **16 Claims**



1. In combination in an integrated circuit chip to correct for second order errors resulting from stresses in the integrated circuit chip,

a first matrix disposed on the chip and containing a plurality of current sources in successive rows and columns,

a second matrix disposed on the chip in spaced relationship to the first matrix and containing a plurality of current sources in successive rows and columns,

means for providing for the simultaneous selection of the current sources in different rows in the first matrix and the current sources in different rows in the second matrix on an inverse basis to the rows in the first matrix, and

means for providing for the sequential selection in each of the first and second matrices of pairs of the rows in a pattern providing progressive convergences an then divergences of the successive pairs of selected rows in each of such matrices relative to the center of such matrix.

4,812,819

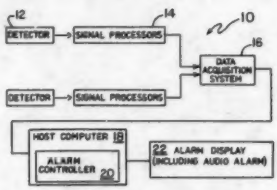
FUNCTIONAL RELATIONSHIP-BASED ALARM PROCESSING SYSTEM

Daniel R. Corsberg, Idaho Falls, Id., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 37,897, Apr. 13, 1987, Pat. No. 4,749,985. This application Apr. 22, 1988, Ser. No. 184,927

Int. Cl.[4] G08B *23/00*

U.S. Cl. 340—517 **29 Claims**



1. A system for monitoring a process characterized by a plurality of process alarms A and B each representing a respective operating state of said process as of primary importance or of secondary importance based upon functional relationships among said alarms, said system comprising:

a plurality of detectors each responsive to a respective process alarm;

recording means coupled to said plurality of detectors for recording the occurrence of an alarm; and

signal processing means coupled to said recording means and responsive to the occurrence of an alarm recorded therein for evaluating the operating state of the process and assigning an importance to its associated alarm by defining each of the alarms A and B in terms of one of the following relationship categories:

alarm A is a level precursor of alarm B such that alarm A should occur before alarm B;

alarm A is a direct precursor of alarm B such that alarm A should occur before alarm B and alarm A's occurrence implies alarm B's occurrence;

alarm A is a priority required action of alarm B such that occurrence of alarm B should cause the activation of alarm A; or

alarm A is a blocking condition for alarm B such that, with both alarms A and B activated, alarm B will not be processed until alarm A is no longer activated, or clears; and

wherein primary importance is assigned to an activated alarm and secondary importance is assigned to that alarm which is not activated when one of the alarms is activated and the other alarm is not activated, and, where both alarm A and alarm B are activated, assigning primary importance to alarm B and secondary importance to alarm A where alarm A is a level precursor of alarm B or assigning primary importance to alarm A and secondary importance to alarm B for the remaining relationship categories between alarms A and B.

4,812,820

ELECTRONIC SURVEILLANCE SYSTEM AND TRANSCEIVER UNIT THEREFOR

Ian M. Chatwin, 107 Thomas Street, East Brighton, Victoria, Australia (3187)

PCT No. PCT/AU86/00209, § 371 Date Mar. 18, 1987, § 102(e) Date Mar. 18, 1987, PCT Pub. No. WO87/00711, PCT Pub. Date Jan. 29, 1987

PCT Filed Jul. 23, 1986, Ser. No. 49,293

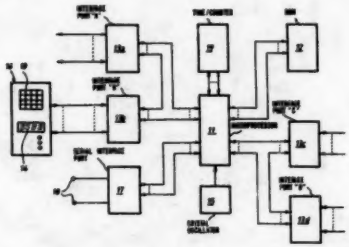
Claims priority, application Australia, Jul. 23, 1985, PH1606

Int. Cl.[4] G08B *26/00*; H04Q *1/30*

U.S. Cl. 340—518 **13 Claims**

1. An electronic surveillance system comprising a plurality of transceiver units at spaced locations within the system,

characterized in that each of said transceiver units comprises means for establishing a cycle of operation, for transmitting digital data in turn, to all other units of the system at an exclusive time slot in said cycle of operation, said data identifying the particular unit transmitting data and providing status information, means for recognizing, at all times, a said transmission from any other unit of the system and also identifying a transmission from the immediately preceding unit in said cycle, and performing a said transmission next in turn thereafter, the unit last in said cycle including means for transmitting coded information such that the first unit in said cycle can identify the end of a cycle and recommence, and each said unit comprises means for responding to the failure of any one unit of the system to transmit said data in turn, and for responding to receipt of said status information.

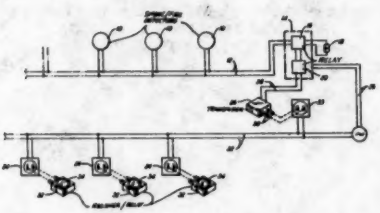


4,812,821

VISUAL FIRE ALERT SYSTEM

Michael J. Santy, 161 Kenwood Ave., and Terence J. Santy, 236 Carbon St., both of Syracuse, N.Y. 13208

Filed Apr. 24, 1987, Ser. No. 41,929
Int. Cl.[4] G08B *1/08*; H04M *11/04*
U.S. Cl. 340—538 **10 Claims**



1. A fire alert system for the hearing impaired in a building having an existing 115v AC wiring circuit, said system comprising:

(a) a plurality of detectors positioned at selected locations within said building and connected in a first portion of said circuit, each of said detectors being actuable in response to sensed presence of smoke and/or heat above a predetermined level to emit a first electrical signal through said wiring circuit;

(b) an alarm panel connected in said circuit and including a first normally open relay switch and means for closing said first switch in response to said first signal;

(c) a transmitter device having signal generating means actuable to emit a second electrical signal for transmission on an electrical conductor;

(d) means connecting said transmitter device to said first switch for actuation of said signal generating means in response to closing said first switch;

(e) a plurality of wall receptacles connected in a second portion of said circuit on the opposite side of said alarm panel from said first portion;

(f) first plug means connecting said transmitter device to one of said wall receptacles for transmission of said second electrical signal through said second portion of said wiring circuit;

(g) at least one receiver device having a second normally open relay switch and signal receiving means responsive to said second electrical signal to close said second switch;

(h) second plug means connecting said receiver device to another of said wall receptacles for receiving said second electrical signal through said second portion of said wiring circuit; and

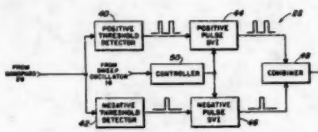
(i) visual alarm means actuable in response to closure of said second switch.

4,812,822

ELECTRONIC ARTICLE SURVEILLANCE SYSTEM UTILIZING SYNCHRONOUS INTEGRATION

John F. Feltz, Fairborn; John W. Taylor, Springboro, and Richard S. Vuketich, Dayton, all of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Aug. 31, 1987, Ser. No. 91,423
Int. Cl.[4] G08B *13/24*
U.S. Cl. 340—572 **20 Claims**



1. A detector for detecting the presence of a resonant tag in a swept frequency field, comprising:

means for detecting the signal produced by a tag present in the swept frequency field, said tag produced signal having positive and negative polarity pulses;

means for separating said positive and negative pulses;

means including a synchronous digital integrator synchronized to the swept frequency field coupled to said separating means for sampling each positive polarity pulse a plurality of times and integrating each sample of the positive polarity pulses over a plurality of sweeps;

means including a synchronous digital integrator synchronized to the swept frequency field coupled to said separating means for sampling each negative polarity pulse a plurality of times and integrating each sample of the negative polarity pulses over a plurality of sweeps; and

means coupled to said positive pulse integrating means and to said negative pulse integrating means for providing a detect signal in response thereto upon the detection of a tag produced signal.

4,812,823

LOCKED TRANSMITTER TAG ASSEMBLY AND METHOD OF LOCKABLY ATTACHING SAME TO OBJECT

Brian E. Dickerson, Boulder County, Colo., assignor to BI Incorporated, Boulder, Colo.

Filed Apr. 13, 1987, Ser. No. 37,559
Int. Cl.[4] G08B *13/06*
U.S. Cl. 340—572 **18 Claims**

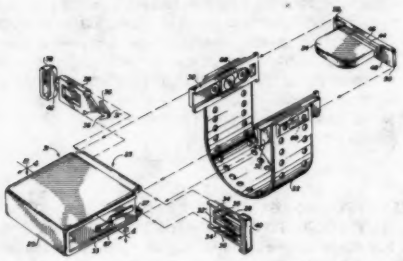
1. An electronic tag for use with an electronic monitoring system comprising:

a housing having electronic circuitry enclosed therein, said electronic circuitry including means for transmitting a signal to a location remote from said tag; and

means for securing and locking said hosing to a limb of an object to be monitored comprising

strap receiving means along respective sides of said housing, said receiving means comprising respective receiving channels having an open end,

a strap having attachment means at each end thereof for attaching each end of the strap to said receiving means of said housing, said attachment means comprising a rail



that can be slidably inserted into said open channels through said open end, said strap having a length that allows it to be wrapped around said limb prior to the attachment of the strap ends to said housing, and

locking means for preventing the removal of said attachment means from said receiving means.

4,812,824

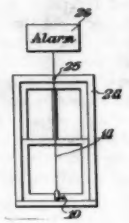
PENDULUM ALARM SENSOR

William Holt, Wilmington, Del., assignor to Alarm Accessory, Ltd., Claymont, Del.

Filed Oct. 9, 1987, Ser. No. 106,381

Int. Cl.[4] G08B *13/02, 13/08*

U.S. Cl. 340—566 **5 Claims**



1. An alarm sensor comprising a housing containing a mercury tilt switch in electrical connection with an alarm circuit, two highly flexible insulated lead wires extending from said tilt switch and housing and being in electrical connection with alarm means within said circuit, said lead wires also supporting said housing containing said switch and extending upwardly therefrom to a support affixed to a window frame or the like, and thence connected to said alarm circuit, said lead wires being at least ten feet long, said housing and switch being supported by said lead wires in pendulum-like fashion adjacent to, but not contacting, a window within said frame, whereby, when a disturbance occurs such as an intruder entering said window, said housing and switch are disturbed and said alarm is sounded.

4,812,825

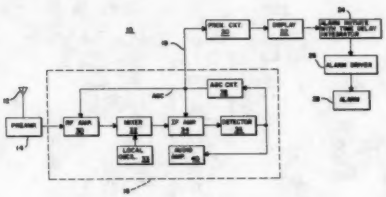
TORNADO WARNING SYSTEM

Richard E. Kennedy, Mt. Vernon, and Earl R. Fredrich, Boonville, both of Mo., assignors to K Electronics, Inc., Pierce City, Mo.

Filed Feb. 10, 1987, Ser. No. 13,037

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—601 **20 Claims**



1. A tornado warning system comprising:

a receiver operable to receive an amplitude modulated electromagnetic signal produced by a tornado within a frequency range within 1 Mhz to 100 Mhz and operable to provide an activity signal dependent on said electromagnetic signal;

an alarm initiate circuit operably connected to respond to said activity signal and operable to produce an alarm initiate signal only after the occurrence of said activity signal for a given time period longer than 10 seconds;

an alarm operable to turn on responsive to said alarm initiate signal; and

wherein said activity signal is an automatic gain control signal from said receiver.

4,812,826

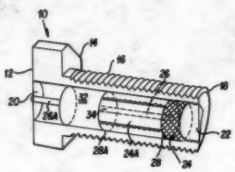
THERMAL SENSOR FOR DETECTION OF RAILROAD BEARING FAILURES

William M. Kaufman, and Alberto Guzman, both of Pittsburgh, Pa., assignors to Carnegie-Mellon University, Pittsburgh, Pa.

Filed Mar. 26, 1987, Ser. No. 31,236

Int. Cl.[4] G08B *21/00, 17/04*; B61K *1/00*

U.S. Cl. 340—682 **6 Claims**



1. A thermal sensor for detection of bearing failures comprising:

a bolt having a head, center and an end, said bolt having a hole passing through the head and center and closed at the end;

a piston having a first side and a second side situated inside the hole of said bolt;

means for detecting when a certain temperature is reached in the bolt, said detecting means disposed in the hole of the bolt and connected to the first side of the piston; and

an antenna disposed in the hole of the bolt and attached to the second side of the piston wherein, when the detecting means detects that a certain temperature on the bearing is reached, it forces the piston towards the head and causes the antenna to protrude from the head of the bolt.

4,812,827

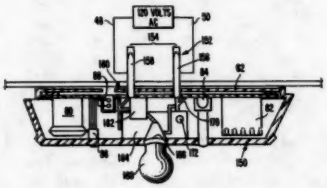
DETECTOR AND LIGHT ASSEMBLY

Keith A. Scripps, 4301 Massachusetts Ave., NW., Washington, D.C. 20016

Continuation-in-part of Ser. No. 935,219, Nov. 29, 1986, Pat. No. 4,717,910, and a continuation-in-part of Ser. No. 797,008, Nov. 12, 1985, Pat. No. 4,694,285. This application Nov. 16, 1987, Ser. No. 120,956

Int. Cl.[4] G08B *23/00*

U.S. Cl. 340—693 **28 Claims**



13. A detector assembly adapted to be removably secured to an electrical power connector connected to a power supply and designed to mate with an opposing electrical connector means comprising:

support means,

electrically powered alarm circuit means mounted upon said support means and operable when activated to provide an audible alarm,

detector means mounted upon said support means, said detector means being connected to said alarm circuit means and operating in response to an alarm condition to activate said alarm circuit means, and

an opposing electrical connector means secured to said support means to form the sole mounting support for said support means, said opposing electrical connector means being configured to be removably engageable with said electrical power connector and being operative to complete an electrical circuit therewith to receive power therefrom.

4,812,828

VIDEO DISPLAY PROCESSOR

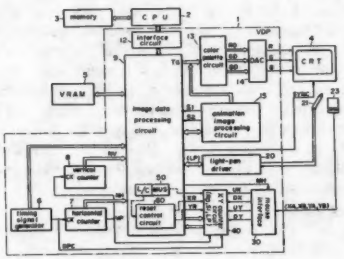
Kazuhiko Nishi; Takatoshi Ishii; Ryozo Yamashita, all of Tokyo; Shigemitsu Yamaoka, and Takatoshi Okumura, both of Hamamatsu, all of Japan, assignors to ASCII Corporation, Tokyo and Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, both of, Japan

Continuation of Ser. No. 739,035, May 29, 1985, abandoned. This application Oct. 7, 1987, Ser. No. 106,007

Claims priority, application Japan, May 30, 1984, 59-110128

Int. Cl.[4] G09G *1/16*

U.S. Cl. 340—706 **15 Claims**



1. A video display processor adapted to be connected to a central processing unit and a video image display unit for displaying a video image composed of a plurality of display elements, each said element adapted to be displayed at a display pixel on a screen of the video image display unit under control of the central processing unit, said video display processor comprising:

(a) clock signal generating means for generating a dot clock signal defining positions on said screen;

(b) image data means for outputting a plurality of image data points, each representative of a respective area of said plurality of display elements of the video image, to the video image display unit in accordance with said dot clock signal;

(c) mode selection means for selecting one of first and second modes, said mode selection means outputting a first mode signal when said first mode is selected, and outputting a second mode signal when said second mode is selected; and

(d) X-Y counter means for accumulating count data,

(1) in response to said first mode signal, by counting a pulse signal from a device which is movable relative to a surface and outputs a pulse signal in accordance with the movement thereof to output movement amount data representative of an amount of said movement of said device to be used to determine an amount of movement from a reference position, said X-Y counter means including means for resetting, in said first mode, when said central processing unit reads said movement data output from said X-Y counter means, and

(2) in response to said second mode signal, counting said clock dot signal to accumulate a tally of count data representative of horizontal and vertical coordinates of a display position of said display element whose image data is being outputted from said image data output means and including means for receiving a signal from a dot position detection device in said second mode, the central processing unit reading said count data from said counter means responsive thereto.

4,812,829

THREE-DIMENSIONAL DISPLAY DEVICE AND METHOD FOR POINTING DISPLAYED THREE-DIMENSIONAL IMAGE

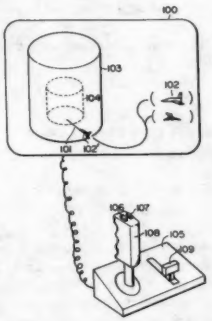
Osamu Ebina, Atsugi, and Seigo Ono, Kofu, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 11, 1987, Ser. No. 48,724

Claims priority, application Japan, May 17, 1986, 61-113192; Aug. 21, 1986, 61-195762

Int. Cl.[4] G09G *1/16*

U.S. Cl. 340—709 **8 Claims**



1. A three-dimensional display device comprising:

display means for displaying on a two-dimensional screen three-dimensional objects, a vector cursor virtually lo-

cated in a three-dimensional space and moving in said space, and a pointer extending from the vector cursor in a direction of movement of the vector cursor for selectively identifying objects intercepted thereby in the three-dimensional space, in response to a display signal;

input means for inputting a parameter for changing the direction of the vector cursor and a pointing signal for controlling said pointer to identify a three-dimensional object displayed by said display means; and

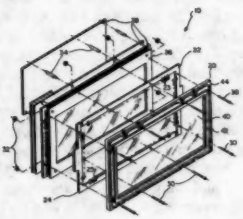
control means connected between said display means and said input means for generating the display signal to display the three-dimensional objects, the vector cursor and the pointer, and including means for recognizing a three-dimensional object pointed to by said pointer in response to the pointing signal.

4,812,830

TOUCH PANEL DISPLAY ASSEMBLY

Roger W. Doering, Hayward, Calif., assignor to Digital Electronics Corporation, Hayward, Calif.

Filed Dec. 8, 1986, Ser. No. 939,529
Int. Cl.[4] G09G *1/00*
U.S. Cl. 340—712 **8 Claims**



1. A touch panel assembly comprising

a filter plate having an outer surface, an inner surface, and a recessed outer surface portion for touch encoding a display,

support means including a plurality of light sources and a plurality of light detectors mounted thereon, said support means comprising a first "L"-shaped support and a plurality of light sources thereon and a second "L"-shaped support and a plurality of light detectors thereon,

means for mounting said support means to said inner surface of said filter plate whereby said support means is positioned adjacent to the inner surface of said filter plate around said recessed outer surface portion and whereby light from a light source passes through said recessed outer surface portion and is then detected by a light detector, and

a display positioned in alignment with said recessed outer surface portion.

4,812,831

KEY SWITCH WITH CONTROLLABLE ILLUMINATION

Carl P. Laier, Reading, Mass., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 10, 1987, Ser. No. 12,971
Int. Cl.[4] H01H *9/16*
U.S. Cl. 340—711 **10 Claims**

1. A keyboard switch of the membrane type comprising:

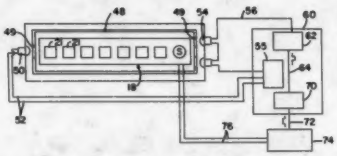
a series of layers suitably spaced apart and having conductive traces thereon to form switch points;

a graphics layer extended thereover including a series of graphic symbols representing switch point functions, each registered with a given switch point, said graphics layer including a layer which is opaque when viewed from above said keyboard;

a source of illumination positioned beneath said graphic layer operable to cause said symbols to appear when energized;

power supply means to control said source of illumination;

logic means and a timer means operable to control said power supply means in a normally off condition to conserve the use of energy and extend the life of said source of illumination; and



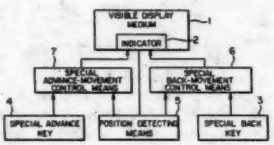
sensing means providing an infrared beam field broadcast over the surface of the keyboard, said sensing means being responsive to the insertion of a stylus into said beam field substantially anywhere in the general key area to interrupt the lightbeam field to activate said logic means and time means to turn said source of illumination on for a predetermined period of time.

4,812,832

INPUT CONTROL DEVICE

Minoru Oishi; Yoshinari Morimoto; Akihiro Furukawa; Tomoko Miura; Yoshie Ikeda, and Akemi Nagatsuna, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Jul. 15, 1987, Ser. No. 73,730
Claims priority, application Japan, Jul. 15, 1986, 61-166272
Int. Cl.[4] B41J *3/46*
U.S. Cl. 340—709 **9 Claims**



1. In an input control device which, for data entry along a line having a beginning and an end, specifies a data input position by moving a visual indicator forward or backward between the beginning and end of the line, the improvement which comprises;

a special back key which inputs a command for moving said indicator in a direction toward said beginning of the line;

a special advance key which inputs a command for moving said indicator in a direction toward said end of the line;

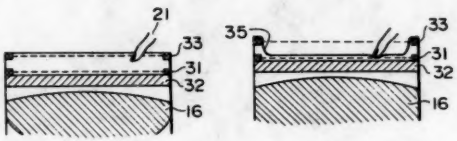
position detecting means for detecting the position of said indicator when one of said keys is depressed;

means responsive to said position detecting means for moving said indicator, in response to a single pressing of said special back key, to said beginning of the line when said indicator is within a data string, said data string including a data space next to the last data thereof, while to end of said data string when the indicator is outside said data string; and

means responsive to said position detecting means for moving said indicator, with said special advance key once depressed, to (1) said end of data string when said indicator is positioned within said data string except at the end of said data string, and (2) to said end of line when the

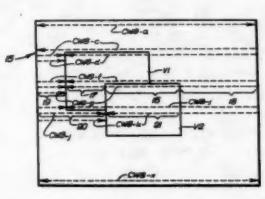
indicator is outside said data string or at said end of data string.

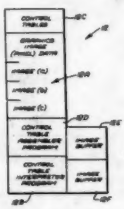
4,812,833
TOUCH PANEL INPUT DEVICE
Hiroshi Shimauchi, Owariasahi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Filed May 29, 1987, Ser. No. 55,547
Claims priority, application Japan, May 30, 1986, 61-123304
Int. Cl.[4] G09G 1/00
U.S. Cl. 340—712 7 Claims



1. A touch panel input device to be activated by a touch input member, comprising:
display means for displaying images of a plurality of input display elements and selectively indicating an inputted one of the display elements;
a transparent, flat panel disposed over said display means;
first sensor means disposed at said flat panel for detecting the touch input member and thereby inputting the selected display element;
second sensor means disposed over said flat panel and spaced from said first sensor means in a direction away from said flat panel;
said second sensor means forming a sensing plane for detecting that the touch input member has approached toward said first sensor means and thereby selecting one of said display elements, before inputting the selected display element and before said touch input member is detected by said first sensor means; and
means responsive to said second sensor means selecting one of said display elements for displaying a cursor on said display means at a position corresponding to the position of said touch input member relative to said flat panel as detected by said second sensor means so that the cursor and the image of said one of said display elements overlap each other on said display means before the touch input member is detected by said first sensor means.

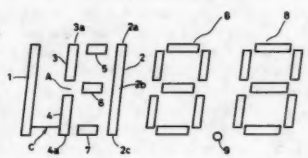
4,812,834
GRAPHICS DISPLAY SYSTEM WITH ARBITRARY OVERLAPPING VIEWPORTS
Charles H. Wells, Portola Valley, Calif., assignor to Cadtrak Corporation, San Mateo, Calif.
Filed Aug. 1, 1985, Ser. No. 761,753
Int. Cl.[4] G09G 1/00
U.S. Cl. 340—721 5 Claims





1. A control system for generating a video displayable graphics image in which pixel data representing said image is stored in a memory and is assembled in accordance with a control table also stored in said memory, the improvement wherein:
said control table utilizes a set of control word sequences, each sequence including a first control word or words specifying the portion of said stored pixel data which is to be displayed in a segment of a single viewport and at least one continuation control word specifying the portion of said stored pixel data which is to be displayed in a segment of a separate viewport which overlaps a portion of said single viewport, and wherein:
said system includes means for utilizing the contents of said first control word or words and the contents of said at least one continuation control word to assemble a graphics image having overlapping viewports in which said segments of said single viewport and said separate viewport have no interviewport spacing between them.

4,812,835
DISPLAY SEGMENT CONFIGURATION SUITABLE FOR CELSIUS AND FAHRENHEIT THERMOMETER
Yoshihiro Wada, Nara, and Ryoichi Fujii, Kyoto, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 670,891, Nov. 13, 1984, abandoned.
This application Aug. 3, 1987, Ser. No. 81,611
Claims priority, application Japan, Nov. 17, 1983, 58-217552
Int. Cl.[4] G09G 3/04
U.S. Cl. 340—756 9 Claims

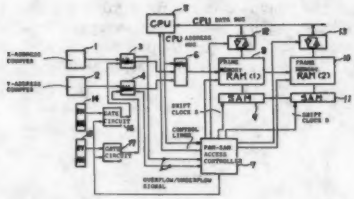


1. A segment arrangement for digitally displaying figures on a display in a thermometer, said display having a first and second portion, said segment arrangement comprising:
first digit display means for selectively displaying at least two figures in the first portion of said display, one of said at least two figures comprising two minor vertical segments and one major vertical segment, said two minor vertical segments being longitudinally aligned to form an upper and a lower minor vertical segments;
second digit display means for displaying a plurality of figures in the second portion of said display;
driving means for actuating the display of figures by said first and second digit display means; and
connection means between said lower, minor vertical segment and the other of said at least two figures of said first digit display means, said other of said at least two figures only being actuated when said lower minor vertical segment is actuated by the driving means, the actuation of said other of said at least two figures being permitted by said connection means , said other of said at least two figures of said first display means comprises a vertical major segment which is about the same size as the one major, vertical segment.

4,812,836
PICTURE PROCESSING APPARATUS

Mitsuo Kurakake, and Shoichi Otsuka, both of Hino, Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP86/00202, § 371 Date Dec. 5, 1986, § 102(e) Date Dec. 5, 1986, PCT Pub. No. WO86/06523, PCT Pub. Date Nov. 6, 1986
PCT Filed Apr. 23, 1986, Ser. No. 2,399
Claims priority, application Japan, Apr. 30, 1985, 60-93488
Int. Cl.[4] G09G *1/02*
U.S. Cl. 340—724 1 Claim



1. A picture processing apparatus for shifting picture data corresponding to a picture displayed on a display screen to a predetermined position, comprising:

(a) first frame memory means for storing one frame of picture data;

(b) second frame memory means for storing another frame of picture data;

(c) first SAM (serial access memory) means for receiving the picture data from said first frame memory means and for providing the picture data in accordance with a first shift clock;

(d) second SAM means for receiving the picture data from the first SAM means and for providing the picture data in accordance with a second shift clock;

(e) X- and Y-address counter means for designating addresses of the first and second frame memory means;

(f) register means for storing an X offset and a Y offset; and

(g) SAM controller means for providing the first shift clock in accordance with the X offset so that the first SAM means provides the picture data offset by an amount corresponding to the X offset, and providing the second shift clock in accordance with the Y offset so that the second SAM provides the picture data to an address of the second frame memory means offset by an amount corresponding to the Y offset.

4,812,837
LC DISPLAY DEVICE WITH BOTH POSITIVE AND NEGATIVE IMAGE DISPLAY MODES

Tomikatsu Shiraishi, Nara, and Mitsuru Fujiwara, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 884,509, Jul. 11, 1986, abandoned. This application Jun. 13, 1988, Ser. No. 205,524
Claims priority, application Japan, Jul. 12, 1985, 60-154967
Int. Cl.[4] G09G *3/36*
U.S. Cl. 340—784 3 Claims

1. A liquid crystal display device, comprising:

a liquid crystal display panel having a plurality of liquid crystal dot matrix display elements;

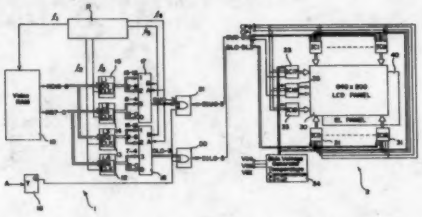
memory means for storing display data for each display element of said display panel;

control means for controlling the reading out of said data from said memory means as output display data signals;

positive/negative mode selector means for selecting one of a positive display mode in which data is displayed on said panel as lighted elements against a dark background, and a negative display mode in which data is displayed on said panel as dark elements against a lighted background;

read means responsive to said control means for reading said output display data signals from said memory means, including a plurality of latch circuits for storing said output data signals and a plurality of exclusive-OR gates having first input terminals coupled to receive said stored output data signals;

said positive/negative mode selector means including a



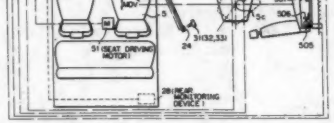
flip-flop circuit for inputting a positive or negative mode signal to second input terminals of said exclusive-OR gates, said negative mode signal causing said exclusive-OR gates to invert the data signals at said first input terminals and output the inverted signals at output terminals, said positive mode signal allowing data signals at said first input terminals to be output on said output terminals; and

driver means coupled to said output terminals for driving said display elements to display an image represented by said data signals.

4,812,838
VEHICLE SEAT DRIVE CONTROL DEVICE

Syuzaburou Tashiro, Okazaki; Toshikazu Ina, Nagoya; Osamu Nakano; Masahiro Taguchi, both of Aichi; Sadahisa Onimaru, Nishio, and Akira Kuno, Oobu, all of Japan, assignors to Nippondenso Co., Ltd., Nishio and Nippon Soken, Inc., Kariya, both of, Japan

Continuation of Ser. No. 761,415, Aug. 1, 1985, abandoned. This application Oct. 30, 1987, Ser. No. 115,610
Claims priority, application Japan, Aug. 3, 1984, 59-162966; Aug. 3, 1984, 59-162967; Aug. 3, 1984, 59-162968
Int. Cl.[4] G05B *19/42*; B60K *26/00*
U.S. Cl. 340—825.06 16 Claims



1. A drive control device for a seat in a vehicle commprising:

entry detection means for detecting an entry of a driver into said vehicle;

battery capacity detection means for detecting a capacity of an electric power source battery in said vehicle;

engine start detection means for detecting a start of an engine of said vehicle;

seat drive means for causing movement of said seat;

controlling circuit means for receiving signals from said entry detection means, said battery capacity detection means and said engine start detection means and deliver-

ing a drive control signal to said seat drive means, and for deciding whether the capacity of said battery is lower than a predetermined reference value when an entry is detected by said entry detection means, and for prohibiting said movement of said seat when the decision of said battery capacity decision function is affirmative and the detection of said engine start detection means is negative, and for enabling movement of said seat when the decision of said battery capacity decision function is negative.

4,812,839

SYSTEM FOR CONTROLLING NETWORK ACTIVATION SEQUENCE

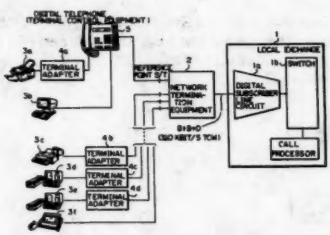
Sumie Okada; Takashi Nara, both of Yokohama; Takashi Hatano, Machida; Yutaka Kawato, Tokyo; Ryoji Shimozono; Kenji Tsutsumi, both of Kawasaki; Yasunori Ogawa, Yokohama, and Yasuo Tanaka, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 828,692, Feb. 12, 1986, abandoned, which is a division of Ser. No. 769,608, Aug. 26, 1985, abandoned. This application Mar. 15, 1988, Ser. No. 170,120

Claims priority, application Japan, Aug. 31, 1984, 59-182233; Sep. 7, 1984, 59-187400

Int. Cl.[4] G08B 5/36; H04L 7/10

U.S. Cl. 340—825.14 **2 Claims**



1. An ISDN subscriber line, comprising:

network terminal means for providing signals and receiving signals, including maintenance signals;

terminal equipment connected to said network terminal means; and

an exchange terminal, connected to said network terminal means, so as to constantly send a training pulse for frame synchronization and bit synchronization, and connected to receive signals from a host device, said exchange terminal comprising:

detecting means for detecting maintaining signals;

output means for outputting the maintenance signals; and

control means for selecting one of the maintenance signals to be output in accordance with one of a signal which provides instructions to the exchange terminal from the host device and a maintenance signal output from said network terminal, said control means selecting one of the maintenance signals and said output means outputting said selected maintenance signal to said network terminal means in accordance with one of the output signals from said network terminal means and a signal from said host device.

4,812,840

MULTIPLE MODE SWITCHING MEANS

Donald J. Girard, Cambridge, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 29, 1987, Ser. No. 67,563

Int. Cl.[4] H04Q 1/00

U.S. Cl. 340—825.5 **10 Claims**

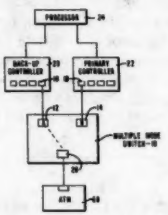
1. A switching device capable of connecting a first or a second apparatus to a third apparatus and capable of operating in a first operating mode in which either the first apparatus or the second apparatus can be manually selected for connection to the third apparatus, in a second operating mode in which either the first apparatus or the second apparatus can request connection to the third apparatus and will retain such connection as long as needed, and in a third operating mode in which one of the first and second apparatuses is a priority apparatus and the other of the first and second apparatuses is a non-priority apparatus and said priority apparatus will always obtain and retain connection to the third apparatus when need, comprising, in combination:

a first port for coupling of the switching device to said first apparatus;

a second port for coupling of the switching device to said second apparatus;

a third port for coupling of the switching device to said third apparatus;

first manually controlled switching means for selecting either the first operating mode, the second operating mode or the third operating mode;



second manually controlled switching means operatively coupled to said first manually controlled switching means for selecting the first or second apparatus in the first operating mode;

first logic means operatively coupled to said first manually controlled switching means for selecting either said first apparatus or said second apparatus for interconnection to said third apparatus in response to a request signal from either said first apparatus or said second apparatus when said switching device is operating in said second operating mode; and

second logic means operatively coupled to said first manually controlled switching means for selecting whichever of said first or second apparatus has priority in response to a request signal therefrom when said switching means is operating in said third operating mode.

4,812,841

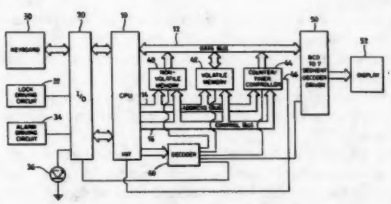
COMPUTER-CONTROLLED PASSWORD LOCK

Hai C. Chen, Fl. 3, 36, Han Sheng W. Rd., Panchiao, Taiwan

Filed May 26, 1987, Ser. No. 53,731

Int. Cl.[4] H04Q 9/00

U.S. Cl. 340—825.31 **2 Claims**



1. A computer-controlled password lock system having a lock drivig circuit and a computer coupled thereto, compris-

ing: keyboard means for entering a keyed-in password; timer means for establishing a time-varying symbol; indicator means coupled to the timer means for indicating the time-varying symbol; memory means for storing a password formed by a plurality of coded symbols; data processing means coupled to the timer means and the memory means for replacing at least one of the coded symbols of the preset password stored in the memory means with the time-varying symbol to form a current password; comparator means coupled to the memory means for detecting coincidence between the keyed-in password and the current password; and means interconnecting the comparator means with the lock driving circuit for generating a lock opening signal in response to said detection of coincidence, said computer further including alarm means coupled to the comparator means for generating an alerting signal in response to non-coincidence between the keyed-in password and the current password, the time varying symbol established by the timer means including at least two variable numerical codes, the plurality of coded symbols of the preset password stored in the memory means including a varying password setting code and a symbol selecting code, said data processing means including means for retrieving the preset password stored in the memory means when said keyed-in password is entered and means for detecting said a varying password setting code and a symbol selecting code to replace at least two different coded symbols of the preset password.

4,812,842

DEVICE FOR THE CONTROL OF ROTARY PRINTING MACHINES

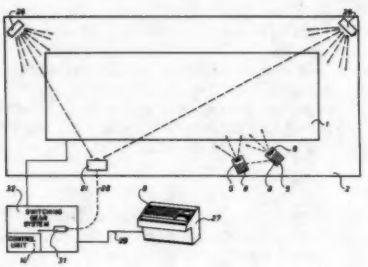
Friedrich K. Bayerlein, Veitshöchheim; Dietrich R. K. Leuerer, Würzburg, and Karl H. Rindfleisch, Margetshöchheim, all of Fed. Rep. of Germany, assignors to Koenig and Bauer A. G., Wurzburg, Fed. Rep. of Germany

Filed Apr. 28, 1987, Ser. No. 43,514

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1986, 3614744

Int. Cl.[4] H04Q 7/00; H04B 9/00; B41F 5/04

U.S. Cl. 340—825.720 **9 Claims**



1. A device for the remote control of a printing machine, comprising;

at least a first electronic machine control signal means for controlling a mechanism of a printing machine;

means to generate control signal sequences for said control means;

first transmitter means to wirelessly transmit control signal sequences from said control signal sequence generating means;

first receiver and decoding means connected to said electronic machine control signal means for receiving and encoding wirelessly transmitted control signal sequences from said transmitter means, and feeding the sequences to said control means; and,

means to verify that the control signal sequence received by the receiver is the same as the control signal sequence transmitted by the transmitter, said means to verify comprising;

second transmitter means connected to said first receiving and decoding means for retransmitting a received control signal sequence;

second receiving and decoding means for receiving a retransmitted control signal sequence from said second transmitter means;

comparator means connected to said first transmitter means and said second receiving and decoding means for comparing a control signal sequence in said transmitter with a control signal sequence received by said second receiving and decoding means;

means to generate a confirmation signal sequence if the control signal sequences in the comparator coincide; and,

means to transfer said confirmation signal sequence to said first transmitter means for transmission to said first receiver and decoding means, where said confirmation sequence is received, decoded, and fed to said control means.

4,812,843

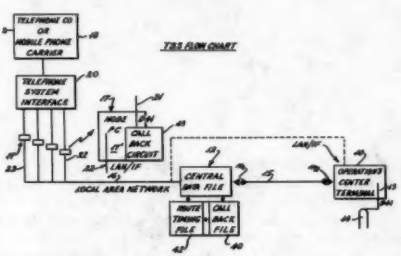
TELEPHONE ACCESSIBLE INFORMATION SYSTEM

C. Paul Champion, III, 871 Coachway, Annapolis, Md. 21401; Robert W. Libero, 2226 Coppersmith Sq., Reston, Va. 22091, and Walter J. Palmer, 12210 Waples Mill Rd., Oakton, Va. 22124

Continuation-in-part of Ser. No. 45,473, May 4, 1987, abandoned. This application Aug. 11, 1987, Ser. No. 84,439

Int. Cl.[4] G08G 1/12, 1/09

U.S. Cl. 340—905 **19 Claims**



1. An information system for providing traffic information to subscribers by way of telephone and mobile phone communication systems regarding predesignated commuter routes identified by route designation codes where access to the information system is obtained using subscriber access codes

comprising, a central data file source for identifying subscribers and for identifying predesignated commuter routes by route designation code , a control terminal means

for creating updated traffic information messages, means for transmitting updated traffic information messages from said control terminal means to said central data file source, a telephone system interface means for connecting the information system to the telephone and mobile phone communication systems, at least one node means for receiving telephone transmissions from said interface means, said at least one node means including computer means and analog communication means, said analog communication means being capable of receiving signals from said telephone system interface means and transmitting information to said computer means, siad computer means identifying the subscriber access codes, communication network means disposed between said node means and said central data file source so that information may be transmitted from said central data file source to said computer means of said node means, said computer means and

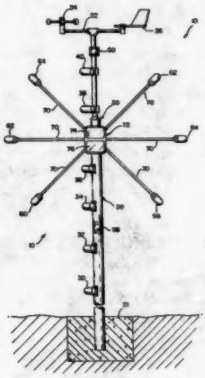
said analog communication means being selectively operable to transmit vocal and digital communication to the subscriber in response to receiving route designation codes which are identified by said computer means and said node means terminating communication in response to the completed transmission of information therefrom to the subscriber.

4,812,844

WINDSHEAR DETECTION INDICATOR SYSTEM

Walter H. Kallstrom, 1303 NE. Sunset Way, Poulsbo, Wash. 98370

Filed Feb. 13, 1987, Ser. No. 14,585
Int. Cl.[4] G08G 5/00
U.S. Cl. 340—949 5 Claims



1. Windshear detection and indication system for airports, comprising:

(a) a plurality of wind indicator devices provided to the side and generally parallel to the approach and takeoff path of a runway for airplanes, said plurality of indicators being spaced a predetermined distance apart to detect wind conditions in its area;

(b) each said indicator device consisting of a generally upright pole of predetermined height and supported so as to be visible to aircraft using said runway,

(c) said pole including a series of first lights of one color disposed vertically in spaced apart relationship such that each of said first lights represents an increment of wind speed,

(d) said pole also including a plurality of second lights of a different color and disposed in a circular spaced apart pattern, a predetermined number of which being supported on radially disposed arms, and on said pole, said plurality of second lights including two of said lights being horizontally diametrically opposed to define two upper quadrants and two lower quadrants in said circular pattern so that wind direction from the side or from the front of an aircraft's path is indicated by said second lights at the horizontal or above in the upper two quadrants, and so that wind direction from the rear of an aircraft's path is indicated by second lights at the horizontal or below in the lower two quadrants,

(e) a green light means attached to said pole in the upper two quadrants to indicate with said second lights above the horizontal that wind direction is favorable,

(f) a red light means attached to said pole in the lower two quadrants to indicate with said second lights below the horizontal that wind direction is or angles from the rear of an aircraft's path to indicate that a tailwind condition exists, and

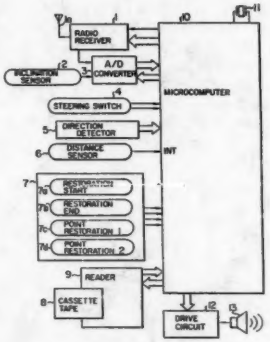
(g) anemometer and wind direction indicator means on said pole to provide information to said first and second light means thereon.

4,812,845

VEHICLE RUNNING GUIDE SYSTEM

Motokazu Yamada, Nagoya; Hideyuki Hayakawa, Nishio; Tomonori Fukui; Hajime Matsuhashi, both of Kariya; Yasuhiro Kaneko, Kariya; Motozo Ikeda, Kariya, and Tomihiko Nagata, Oobu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 568,795, Jan. 6, 1984, abandoned. This application Feb. 2, 1987, Ser. No. 11,366
Claims priority, application Japan, Feb. 24, 1983, 58-30429
Int. Cl.[4] G08G 1/12
U.S. Cl. 340—995 17 Claims



1. A running guide system for a vehicle in which said vehicle is guided along a predetermined running route on which a plurality of check points including a start point are point, comprising:

distance detector means for detecting a running distance traveled by said vehicle and producing a running distance signal indicative thereof;

memory means having check point data indicating said plurality of check points stored therein, said check point data including distance data ds indicating respective relative positions between the check points, and condition data indicating a specific running condition of said vehicle at said check points, for use in checking whether said vehicle has been displaced from said running route at points adjacent one of said check points;

condition detector means for detecting a running condition of said vehicle;

computer means including:

(1) reading means for reading said distance data ds from said memory means;

(2) correcting means for correcting said distance data ds, when said vehicle is positioned at one of said checkpoints, by adding distance error data Δd, indicative of a distance error between a previous distance between two checkpoints and a previous distance data ds indicative of said distance between said two checkpoints, to said distance data ds to form corrected distance data ds';

(3) setting means for setting said distance error data Δd to equal said corrected distance data ds';

(4) reducing means for reducing said distance error data Δd in accordance with said running distance signal from said distance detector means;

(5) first decision means for determining whether said distance error data set by said setting means has been reduced to a value lower than a predetermined value;

(6) second decision means for accessing said memory

means to determine a checkpoint and a first specific running condition indicative thereof, and for determining whether said running condition detected by said condition detector means is said first specific running condition when said first decision means determines that the distance error data has been reduced to said predetermined value; and

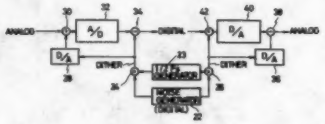
(7) information means for providing alarm information indicating that the vehicle is out of said predetermined running route when said second decision means determines that said first specific running condition of the vehicle is not detected by said condition detector means.

4,812,846

DITHER CIRCUIT USING DITHER INCLUDING SIGNAL COMPONENT HAVING FREQUENCY HALF OF SAMPLING FREQUENCY

Masao Noro, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Continuation of Ser. No. 945,375, Dec. 22, 1986, abandoned.
This application Jul. 19, 1988, Ser. No. 220,419
Claims priority, application Japan, Jan. 8, 1986, 61-1801
Int. Cl.[4] H03K *13/00*
U.S. Cl. 341—131 **6 Claims**



1. A dither circuit comprising:

an A/D converter;

an adder provided in a prior stage to said A/D converter;

a subtractor provided in a posterior stage to said A/D converter; and

dither supplying means for supplying dither to said adder and subtractor, said dither supplying means comprising:

a ½ Fs signal generator for generating a ½ Fs signal having a frequency which is ½ of a sampling frequency Fs to provide a first dither component;

a noise generator for generating random noise to provide a second dither component; and

an adder for adding the ½ Fs signals and the random noise together and supplying a resulting sum signal to said adder and subtractor as dither, said dither including said first and second dither components to increase conversion linearity and reduce quantizing noise.

4,812,847

PARALLEL PORT PASS-THROUGH DIGITAL TO ANALOG CONVERTER

John L. Stewart, 3430 Bardell Ave., Eugene, Oreg. 97401, and Bradley C. Stewart, 292 N. Grand, Eugene, Oreg. 97402

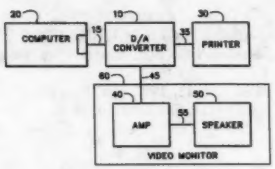
Filed Oct. 2, 1987, Ser. No. 104,196
Int. Cl.[4] H03M *1/78*
U.S. Cl. 341—154 **7 Claims**

1. A digital-to-analog converter device adapted for connecting to a parallel printer port of a personal computer having a plurality of binary data lines, a ground line, and an active-negative strobe line, while allowing said parallel printer port to communicate with a printer, said converter device comprising:

(a) an input port connector having a multiplicity of input contacts, a plurality of said input contacts being adapted to receive binary data from said parallel printer port data lines, with a first of said input contacts being adapted to receive a signal from said active-negative strobe line, and a second of said input contacts being adapted to receive a ground signal from said parallel printer port ground line;

(b) an output port connector having output contacts corresponding to said input contacts;

(c) a plurality of signal wires directly connecting said input contacts to said corresponding output contacts; and



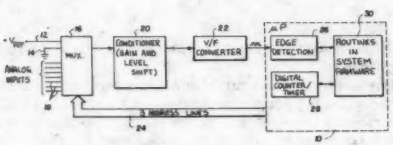
(d) a conversion network means electrically connected to said input contacts for receiving binary data therefrom and for converting said binary data to analog voltage signals, said conversion network means having a sufficiently high input impedance such that said parallel printer port may operatively communicate with a printer connected to said output port connector.

4,812,848

ANALOG TO DIGITAL CONVERSION

John J. Fry, Wickliffe, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Sep. 2, 1987, Ser. No. 92,115
Int. Cl.[4] H03M *1/60*
U.S. Cl. 341—157 **11 Claims**



1. A method of converting an analog voltage signal to a digital signal, comprising:

applying the voltage signal to the input of a voltage to frequency converter which outputs a pulse train having pulses at a frequency which is a function of the voltage level of the voltage signal;

sampling the pulse train during a fixed sampling period having a duration containing at least a plurality of pulses of the pulse train and being sufficiently close to the peak period for filtering AC power line noise to still provide such filtering;

detecting the leading edge of a first pulse of the pulse train in the sampling period;

storing the occurrence time of the leading edge of the first pulse;

detecting the leading edge of a last pulse of the pulse train in the sampling period;

storing the occurrence time of the leading edge of the last pulse;

counting the number of pulses in the sampling period between the occurrence times;

calculating the difference between the occurrence times as a measurement of the time duration for the counted number of pulses; and

dividing the counted number of pulses by the time duration for the counted number of pulses as a measurement of the frequency of the pulse train, the frequency of the pulse

train comprising a digital signal which is a function of the voltage signal.

4,812,849

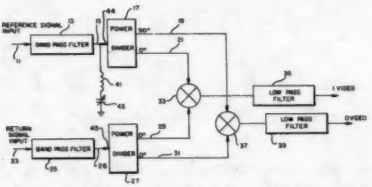
NONQUADRATURE CORRECTION CIRCUIT

Vedon W. Otto, Burleson, Tex., assignor to General Dynamics Corporation, Fort Worth, Tex.

Continuation of Ser. No. 651,416, Sep. 17, 1984, abandoned. This application Sep. 28, 1987, Ser. No. 104,061

Int. Cl.[4] G01S 7/40; G01R 25/04

U.S. Cl. 342—194 **17 Claims**



1. In a power divider which receives at a reference signal input, a reference signal comprised of a fundamental reference frequency and its harmonics, the power divider producing two outputs, an improved means to vary the phase delay between the two outputs, comprising:

tunable frequency trap means connected between the reference signal input and a ground, the trap having a center frequency which is approximately the third harmonic of the fundamental reference frequency for providing a low impedance path to ground for the third harmonic of the fundamental reference frequency but a high impedance to ground for the fundamental reference frequency.

4,812,850

METHOD AND APPARATUS FOR COMBINING WAVEFORMS

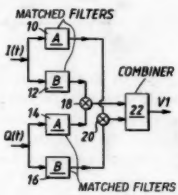
David J. Gunton, Stakeford, and Lucy J. Manning, Tyne, both of England, assignors to British Gas plc, London, England

Filed Mar. 27, 1987, Ser. No. 30,749

Claims priority, application United Kingdom, Mar. 27, 1986, 8607705

Int. Cl.[4] G01S 7/44, 13/06; G01V 3/12

U.S. Cl. 342—22 **11 Claims**



1. A method of producing data indicative of the presence of buried objects using ground probing radar, wherein first and second reference waveforms Ir(t) and Qr(t) have been derived from a radar response to a reference object, said second reference waveform Qr(t) being a quadrature version of said first reference waveform Ir(t), said method comprising:

deriving first and second waveforms I(t) and Q(t) from a radar response to the ground including said objects, said second waveform Q(t) being a quadrature version of said first waveforms I(t);

using a correlation operation @, forming two product waveforms {I(t) @ Ir(t)-Q(t) @ Qr(t)} and {I(t) @ Qr(t)-Q(t) @ Ir(t)}; and

combining said product waveforms to produce said data as the difference between said product waveforms.

4,812,851

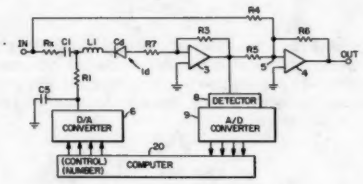
RADIO RECEIVER WITH AUTOMATIC INTERFERENCE CANCELLATION

Mark J. Giubardo, Pepperill, Mass., assignor to Digital Marine Electronics Corporation, Acton, Mass.

Filed Oct. 31, 1985, Ser. No. 793,181

Int. Cl.[4] G01S 1/24

U.S. Cl. 342—389 **51 Claims**



1. In a radio receiver for receiving desired signals in a predetermined frequency band and having means for eliminating a particular narrow frequency band of received signals among the desired signals in an electrical path in the receiver that has an input and an output, the improvement comprising,

(a) a passive variable narrow band pass filter, tunable to the frequency of said undesired narrow band having an input and an output,

(b) means for sampling signals in said electrical path at said input thereof and feeding said sample to said passive filter input,

(c) means for reversing phase of the signals of said sample that reach the output of said passive filter,

(d) means for combining said phase reversed signals with said electrical path output, producing a combined signal output and

(e) said receiver electrical path input, said means for sampling, said passive filter and said means for reversing phase being coupled together in electrical series, in that order, herein called the series filter circuit,

(f) said series filter circuit and said receiver electrical path being coupled electrically in parallel with the output of each coupled to said means for combining and

(g) means for varying said passive filter to insure that said undesired signals are

substantially eliminated from said received signals in said combined signal output.

4,812,852

LOCATING SYSTEM AND METHOD

Rodney B. Bent, Indialantic, and Paul W. Casper, West Melbourne, both of Fla., assignors to Scientific Development Corporation, Palm Bay, Fla.

Filed Feb. 20, 1987, Ser. No. 16,788

Int. Cl.[4] G01S 3/02

U.S. Cl. 342—457 **5 Claims**

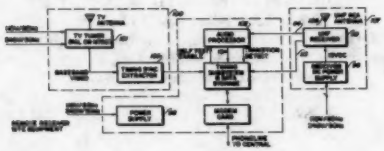
1. A method for detecting the location of a source of a randomly modulated radio signal, said method comprising the steps of:

providing at least three receiving stations at known locations for receiving and demodulating said modulated radio signal;

selecting a common reference level for said radio signal at each of said receiving stations and determining the time of arrival at each receiving station of selected transitions of said demodulated radio signal through said common reference level;

transmitting an indication of the time of arrival of said selected transitions to a central processing means;

identifying common signal segments received at pairs of the receiving stations based upon equal time differences between sequential time of arrival indications in the signal segments;



determining the time of arrival difference between pairs of receiving stations from the time of arrival difference of corresponding transitions in common signal segments;

computing the location of the signal source from the time of arrival differences;

4,812,853

MICROSTRIP ANTENNA

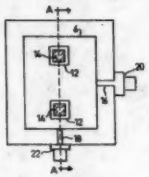
Michael Negev, Rishon Le Zion, Israel, assignor to Elta Electronics Industry Limited, Israel

Filed Sep. 8, 1986, Ser. No. 905,483

Claims priority, application Israel, Sep. 9, 1985, 76342

Int. Cl.[4] H01Q *1/38*

U.S. Cl. 343—700 MS **9 Claims**



1. A multi-antenna array comprising:

a multi-antenna element in the form of a narrow strip and comprising:

a dielectric layer in the form of a narrow strip

a substantially continuous thin metallic layer coated onto one side of the dielectric layer and defining a ground plane;

a plurality of generally elongated discrete thin metallic layer elements coated onto the other side of the dielectric layer each containing within its surface a plurality of voids spaced from one another; at least one further discrete thin metallic coated layer element located witin each of said plurality of voids in noncontacting relationship with said elongated discrete metal layer element ; and

antenna connector means attached respectively to each generally elongated discrete thin metallic layer and

to each further discrete thin metallic coated layer element.

4,812,854

MESH-CONFIGURED RF ANTENNA FORMED OF KNIT GRAPHITE FIBERS

Bobby J. Boan, Indian Harbour Beach, and Martin Schwam, Indialantic, both of Fla., assignors to Harris Corp., Melbourne, Fla.

Filed May 5, 1987, Ser. No. 46,144

Int. Cl.[4] H01Q *1/36*

U.S. Cl. 343—897 **21 Claims**

1. An antenna for electromagnetic waves comprising a conductive open mesh formed of strands of filaments of carbon-containing material, each strand being formed of a bundle of plural filaments of carbon-containing material in which relative movement among filaments of the bundle is afforded, with each opening of said mesh being defined by multiple loops of said strands, wherein at least one of said loops is formed by the same strand folded back upon itself, the mesh being configured such that relative displacement between loops at different portions of the mesh is permitted, thereby enabling the loops of

said strands of filaments of carbon-containing material at relatively different portions of the mesh to pass by one another and enter open regions of the mesh, so as to be effectively mechanically displaceable with respect to one another in the contour of the mesh in response to changes in environmental conditions, whereby the effective contour of the antenna formed by the mesh is retained.

4,812,855

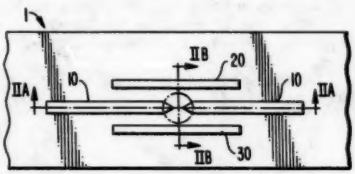
DIPOLE ANTENNA WITH PARASITIC ELEMENTS

Richard J. Coe, Auburn, and Margaret S. Morse, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1985, Ser. No. 781,976

Int. Cl.[4] H01G *19/10*

U.S. Cl. 343—818 **20 Claims**



1. A dipole antenna system coupled to a source of excitation signals having a center frequency of wavelength λ, said dipole antenna system comprising:

a driven dipole element having a length of approximately 0.5λ electrically connected to said source of excitation signals;

two parasitic strip dipole elements each having a length of approximately 0.276λ aligned in parallel with said driven dipole element, said strip dipole elements each being located a predetermined distance of approximately 0.07λ from said driven dipole element, said driven dipole element and said parasitic dipole elements being substantially coplanar in a dipole plane; and

a reflecting ground plane parallel to said driven and said parasitic strip dipole elements, and separated from said dipole plane by approximately 0.219λ,

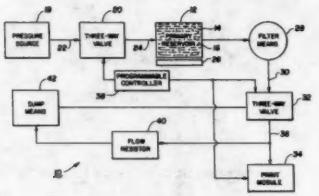
whereby said parasitic strip dipole elements are electromagnetically coupled to said driven dipole element to expand the bandwidth of said dipole antenna system.

4,812,856

METHOD AND APPARATUS FOR DISPENSING A FLUID WITH DISPERSED PARTICLES THEREIN

David B. Wallace, Dallas, Tex., assignor to MicroFab Technologies, Inc., Plano, Tex.

Filed Oct. 30, 1987, Ser. No. 114,609
Int. Cl.[4] G01D *15/16;* **B05C** *11/00;* **B05D** *3/12, 3/00*
U.S. Cl. 346—1.1 **14 Claims**



13. A method of dispensing a fluid with dispersed particles therein comprising the steps of:

(a) providing a primary reservoir containing a predetermined amount of fluid with dispersed particles therein;

(b) agitating said fluid to maintain said dispersed particles suspended in said fluid;

(c) pressurizing said primary reservoir;

(d) providing an output of said pressurized fluid with dispersed particles therein to a mesh filter with openings therein of a predetermined size;

(e) providing an output of said pressurized fluid with dispersed particles therein from said mesh filter to a three-way valve;

(f) providing an output path from the common port of said three-way valve to a print module;

(g) providing an output path from the common port of said three-way valve to a sump which is vented to atmospheric pressure;

(h) providing an output path from the normally open port of said three-way valve to said sump;

(i) cycling said three-way valve at a predetermined rate;

(j) removing the pressure from said primary reservoir;

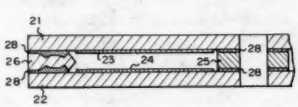
(k) pulsing said print module with a high voltage pulse train which creates a drop of said fluid with dispersed particles therein for each pulse of the high voltage pulse train.

4,812,857

OPTICAL INFORMATION RECORD DISK

Yasushi Murata, and Shuich Yanagisawa, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 23, 1987, Ser. No. 111,681
Claims priority, application Japan, Oct. 30, 1986, 61-166967[U]
Int. Cl.[4] G01D *15/34;* **G11B** *3/70*
U.S. Cl. 346—137 **4 Claims**



1. In an optical information record disk which includes a pair of circular base plates, at least one of which has a signal record layer thereon, a pair of annular spacers for carrying thereof outer and inner circumferential portions of said circular base plates in an opposing parallel relationship such that said signal record layer or layers may be located inside said record disk, and layers of bonding agent for securing said circular base plates and said annular spacers to each other, the improvement wherein at least one of said annular spacers has an annular groove formed on each carrying face thereof on which said circular baseplates are carried, said annular groove including a basin portion having a flattened bottom and a deep portion which is deeper than said basin portion and located at an inner circumference thereof.

4,812,858

INDEXING MECHANISM

Richard A. Murray, San Diego, Calif., assignor to Enter Computer, Inc., San Diego, Calif.

Filed Dec. 17, 1987, Ser. No. 134,011
Int. Cl.[4] G01D *9/30, 15/24*
U.S. Cl. 346—139 R **13 Claims**

1. An apparatus comprising: a carousel in a plotter or other graphics mechanism, the carousel holding a plurality of pens, the carousel rotating about a carousel axle incrementally to present any of the plurality of pens to a drawing arm at a transfer position; an electric power supply; a control device;

a motor, responsive to the control device, said motor including a rotor shaft;

a geneva arm having a post end and a curved end;

a geneva axle connected to the geneva arm, so that the post end and the curved end rotate about the axis of rotation of the geneva axle, said geneva axle being connected to the rotor shaft so that the geneva arm rotates in response to rotation of the rotor shaft;

a geneva sprocket connected to the carousel, said geneva sprocket having a perimeter including a plurality of first surfaces for slidable contact with the post and a plurality of second surfaces for slidable contact with the curved surface of the geneva arm so that the carousel is maintains one of the plurality of pens at the transfer position when the geneva arm rotates while its curved surface contacts said second surface;

a switch for detecting the presence of the geneva arm at a predetermined angle of rotation of the geneva arm about the geneva axle, said switch producing an output signal which is applied to the control device, said predetermined angle being selected so that if the drive means is switched off after detection, the rotating geneva arm will coast to a stop without substantially affecting the position of the carousel.

4,812,859

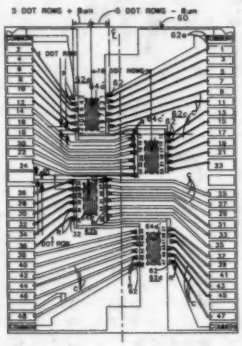
MULTI-CHAMBER INK JET RECORDING HEAD FOR COLOR USE

C. S. Chan; Gary E. Hanson, and Terry M. Nelson, all of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 17, 1987, Ser. No. 98,840
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R **11 Claims**

1. A multichamber ink jet pen for a recording apparatus, comprising:

a pen body having a plurality of ink chambers;
a printhead having a plurality of spaced openings therein and a nozzle group at each opening;
means mounting said printhead on said pen body;
means providing respective individual passages between said chambers and said openings at said printhead at said nozzle groups, providing an individual ink path between each chamber and a corresponding nozzle group;
each nozzle group comprising at least two parallel columns of equally spaced nozzles;
each of said parallel columns of spaced nozzles in a nozzle group has the same number of nozzles, the nozzles of one column of nozzles in a nozzle group being displaced in a direction along the one column, one half of a nozzle space with respect to the nozzles of the other column of nozzles



in that nozzle group, defining an ink dot row space between corresponding nozzles in the tow columns in a nozzle group, measured in a direction paralleling the columns of nozzles;
the center of the columns of nozzles in one nozzle group being parallel to the center of the columns of nozzles in an adjacent group, the centers of the columns being laterally spaced apart a distance greater than the distance between nozzle columns of a nozzle group, providing two spaced, parallel columns of nozzle groups; and
the lowermost end nozzle in a nozzle column of one nozzle group being spaced one dot row space from the uppermost end nozzle in a nozzle column of an adjacent nozzle group, measured in a direction paralleling the nozzle columns.

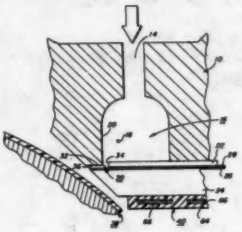
4,812,860

HEATER FOR IONOGRAPHIC MARKING HEAD ARRAY

Nicholas K. Sheridan, Saratoga; Richard G. Stearns, Mountain View, both of Calif.; John A. Frank; Brendan Casey, both of Webster, N.Y., and William Gary, Lyons, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 4, 1988, Ser. No. 190,731
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—159 **6 Claims**

1. An ionographic marking apparatus including a housing, means for generating a supply of marking ions within said housing, means for transporting said marking ions through and out of said housing, and means for controlling the transport of said ions of said housing, said means for controlling comprising a substrate provided on one surface with an array of electrically conducting ion modulation electrodes spaced from one another by electrically insulating regions, the improvement comprising heating means associated with said means for con-



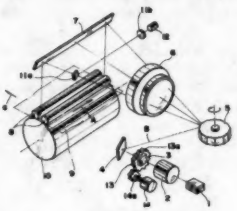
trolling to raise the temperature of said electrically insulating regions so as to prevent the deposition of moisture thereon.

4,812,861

OPTICAL LASER BEAM CONTROL DEVICE FOR PRINTER

Yoshikazu Sasaki, Sagamihara, and Naoya Misawa, Yamato, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 21, 1987, Ser. No. 88,048
Claims priority, application Japan, Aug. 21, 1986, 61-196285
Int. Cl.[4] G01D *15/14*
U.S. Cl. 354—4 **12 Claims**

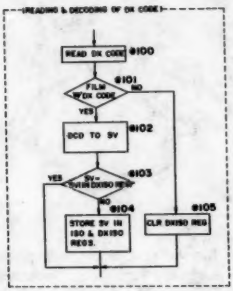


1. An optical laser beam control device for a printer adapted to modulate a laser beam intensity in accordance with a multi-tone image signal and forming a multi-tone image on a photosensitive material by exposing the laser beam from a laser light source thereon, the optical laser beam control device comprising:
an optical member mounted on a laser beam path between the laser light source and the photosensitive material, the laser light source transmitting the laser beam through said optical member;
means for varying the beam transmittance of said optical member;
means for causing the laser light source to emit the laser light beam at a predetermined intensity level previous to the image formation for adjusting the laser beam intensity on the photosensitive material;
means for detecting the intensity of the laser beam transmitted through said optical member, and
means for controlling said varying means in accordance with the intensity detected by said detecting means to adjust the laser beam intensity on the photosensitive material prior to the image formation.

4,812,862
PHOTOGRAPHIC INFORMATION SETTING DEVICE FOR A CAMERA

Akihiko Fujino; Hiroshi Ootsuka, and Tatsuro Izumi, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 9, 1988, Ser. No. 165,731
Claims priority, application Japan, Mar. 10, 1987, 62-55771
Int. Cl.[4] G03B 7/24
U.S. Cl. 354—21 6 Claims



1. A photographic information setting device for a camera comprising:

an automatic film speed reading means for automatically reading out a film speed value, of a film in use, provided on a container of the film;

a first memory means for storing a film speed value, of an actual film, read out by the automatic film speed reading means;

a second memory means for storing a film speed value, of a film used immediately before a film in use, read out by the automatic film speed reading means;

a third memory means for storing a film speed value to be used in deciding an exposure value for a camera;

a film speed altering means for altering a film speed value stored in the third memory means to another film speed value and supplying the third memory means with the latter value to be stored therein;

a comparing means for comparing a film speed value stored in the first memory means with one stored in the second memory means; and

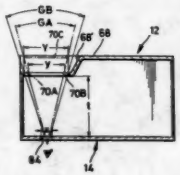
a controlling means for controlling in such a manner that, when the comparison effected by the comparing means results in that the film speeds in the first and second memory means are the same, alteration of a film speed value stored in the third memory means may not be carried out, while, when the film speeds in the first and second memory means are different from each other as a result of the comparison, the film speed value in the first memory means may be stored in both of the second and third memory means.

4,812,863
LENS-FITTED PHOTOGRAPHIC FILM PACKAGE

Hiroshi Ohmura, Tokyo; Seiji Asano, Saitama, and Toshio Yoshida, Ibaragi, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 17, 1988, Ser. No. 158,139
Claims priority, application Japan, Feb. 17, 1987, 62-21576[U]
Int. Cl.[4] G03B 13/04
U.S. Cl. 354—219 4 Claims

1. A lens-fitted photographic film package which comprises at least a taking lens, means for effecting an exposure, and a rolled film all of which are incorporated in a light-tight film case as a unit, said light-tight film case having a direct-vision viewfinder with no finder lens which consists of a viewing opening formed in a rear wall of said light-tight film case and

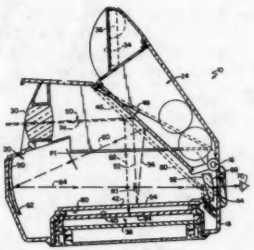


a finder frame opening formed in a rearwardly recessed part of a front wall of said light-tight film casing.

4,812,864
CAMERA AND TWO-ELEMENT VIEWFINDER

James G. Baker, Bedford, N.H., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 16, 1988, Ser. No. 155,990
Int. Cl.[4] G03B 13/02, 19/12
U.S. Cl. 354—224 44 Claims



1. A camera comprising:

image forming means for forming an image of an object to be photographed; and

a viewfinder for viewing the image where said viewfinder consists essentially of:

(a) a reflector with an aspheric surface and;

(b) a lens with an aspheric surface and being optically coupled with said reflector, at least one of said aspheric surfaces being shaped in accordance with a generalized polynomial expression.

4,812,865
CAMERA SYSTEM WITH INTERCHANGEABLE LENS UNIT

Masayuki Ueyama, Toyonaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 14, 1987, Ser. No. 85,177
Claims priority, application Japan, Aug. 18, 1986, 61-192400
Int. Cl.[4] G03B 17/14
U.S. Cl. 354—286 27 Claims

1. A camera system, comprising;

a camera body;

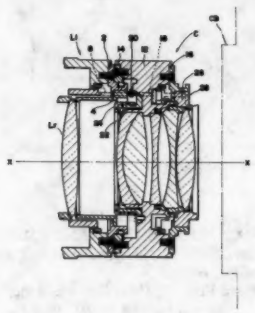
a first type of interchangeable lens unit having a first connecting member for detachably attaching the unit to the camera body;

a second type of interchangeable lens unit having a second connecting member for detachably attaching the unit to the camera body;

an intermediate optical instrument being suitable for use with the first type of lens unit and unsuitable for use with the second type of lens unit and having a third connecting member for detachably attaching the intermediate optical

instrument to the first type of lens unit and so as to be insertable between the camera body and the first type of lens unit; and

the second type of lens unit including means for preventing the second type of lens unit for being coupled with the



intermediate optical instrument, said preventing means provided inside of the second connecting member so as not to interrupt the optical rays passing through the lens unit and not to interfere with the attachment of the second type of lens unit to the camera body.

4,812,866

PHOTOGRAPHIC FILM PACKAGE

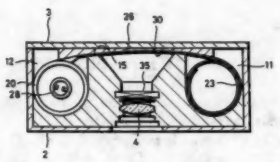
Seimei Ushiro; Hiroshi Ohmura; Michio Cho; Tsutomu Tanaka, all of Tokyo; Yasuhiko Tanaka, Saitama; Seiji Asano, Saitama, and Kazunori Ohno, Saitama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 8, 1988, Ser. No. 153,714

Claims priority, application Japan, Feb. 6, 1987, 62-26132; Feb. 14, 1987, 62-32186

Int. Cl.[4] G03B *17/02*

U.S. Cl. 354—288 **16 Claims**



1. A photographic film package in which a 35 mm-size photographic film, a taking lens system, and an exposure member, with their associated elements, are incorporated in a light-tight film casing as a unit, said taking lens system consisting of a single-element lens having a focal length f (mm) and an F-number defined by the following conditions:

$$F \geq f^2/150$$

$$F \geq 34.3 - 0.75f$$

$$F \leq 16$$

4,812,867

APPARATUS FOR PROCESSING AN EXPOSED PHOTOGRAPHIC FILM WOUND ON A SPOOL

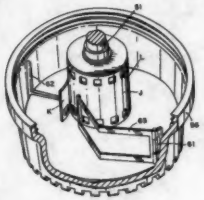
Brian F. Moss, Chelford, and Richard J. Brent, Handforth, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Mar. 15, 1988, Ser. No. 168,413

Claims priority, application United Kingdom, Mar. 25, 1987, 8707133

Int. Cl.[4] G03D *13/06*

U.S. Cl. 354—313 **8 Claims**



1. Apparatus for the processing of exposed photographic film wound on a spool, comprising a substantially cylindrical container, a lid connected to close said container, said lid and container being made of a material impervious to light, together with means to rotate the spool with the wound film and film retaining means provided within the container, wherein the film retaining means includes at least one elastic tongue fastened to and extending inwards from an inner wall of the container, which upon the rotation of the spool in an unwinding direction, enters between a front end of the film and a first outer winding of the wound film and guides said front end to a stop to prevent said front end from slipping around said inner wall as said film unwinds in the container.

4,812,868

DETECTING APPARATUS FOR FOCUS IN CAMERA

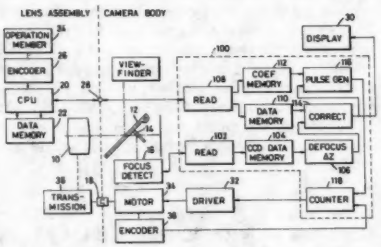
Ken Utagawa, Kawasaki, and Yoshinari Hamanishi, Tokyo, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 30,054, Mar. 25, 1987, abandoned. This application Jun. 29, 1988, Ser. No. 212,170

Claims priority, application Japan, Mar. 28, 1986, 61-70525

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—402 **20 Claims**



1. A camera system, comprising:

a camera body having a predetermined focal plane;

a lens assembly having a photographing optical system and installed detachably on said camera body;

deviation detecting means provided within said camera body for detecting a deviation between the optimum image plane of a subject image formed through said photographing optical system and said focal plane;

data storing means provided within said lens assembly stor-

ing a plurality of data including first data concerning a spherical aberration of said photographing optical system at a first F-number and second data concerning a spherical aberration of said photographing optical system at a second F-number different from said first F-number;

coefficient storing means provided within said camera body storing a coefficient concerning said deviation detecting means; and

means for correcting a detected deviation by means of said plurality of data and said coefficient.

4,812,869

FOCUS DETECTING APPARATUS

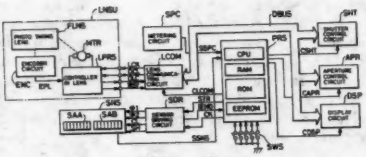
Akira Akashi; Akira Ishizaki; Yasuo Suda, all of Yokohama; Ichiro Ohnuki, Tokyo; Keiji Ohtaka, Tokyo, and Takeshi Koyama, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 7, 1987, Ser. No. 70,383

Claims priority, application Japan, Jul. 10, 1986, 61-160824

Int. Cl.[4] G03B *3/00*; G01J *1/20*

U.S. Cl. 354—408 **3 Claims**



1. In a focus detecting apparatus provided with an optical system for forming first and second images having their relative positional relation varying in accordance with the focus state of an imaging optical system whose focus is to be detected, photoelectric converting means having a plurality of picture elements for outputting first and second photoelectrically converted signals, and operation means for (1) relatively displacing said first and second photoelectrically converted output signals in an operation, (2) finding the amount of deviation between said first and second images, and (3) detecting the focus state of said imaging optical system, improvement apparatus, comprising:

picture element range varying means for changing, in accordance with the focus state of said imaging optical system, the picture element range to be processed in which are produced said first and second signals utilized in the processing process for finding the amount of deviation between said first and second images from said first and second signals is provided in said operatiou means;

wherein said photoelectric converting means has a first range for receiving a light distribution concerning said first image and a second range for receiving a light distribution concerning said second image, said first and second range each having a plurality of sub-ranges covering said range; and

wherein said operation means includes means for calculating a contrast value evaluating contrast and a focus falue representing a focus adjusting state of the optical system in each corresponding sub-range to generate a signal representing the focus adjusting state of the optical system on the basis of said contrast and focus values.

4,812,870

AUTO-BRACKET DEVICE FOR CAMERA

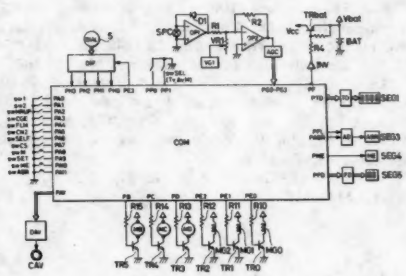
Masaharu Kawamura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1987, Ser. No. 79,128

Claims priority, application Japan, Aug. 1, 1986, 61-179843; Aug. 1, 1986, 61-179846; Aug. 1, 1986, 61-179847; Aug. 1, 1986, 61-179848; Aug. 1, 1986, 61-179850; Aug. 1, 1986, 61-179851

Int. Cl.[4] G03B *7/00, 17/00, 17/36, 17/38*

U.S. Cl. 354—412 **14 Claims**



1. An auto-bracket device for a camera for photographing a plurality of frames with different exposures, comprising:

(a) selection means for selecting an auto-bracket mode;

(b) an auto-bracket exposure control circuit for shifting the exposure for each frame when the plurality of frames are photographed in the auto-bracket mode;

(c) shift setting means for setting the amount by which the exposure is shifted by said exposure control circuit; and

(d) a reset circuit for detecting the shift amount set by said shift setting means and preventing the auto-bracket mode selection when a zero shift amount is set.

3. An auto-bracket device for a camera adapted to operate in a bulb photographing mode in which the bulb photographing mode is set by the operation of a bulb mode selecting member and adapted to continue exposure during the operation of a release operation member and to end exposure by ending the operation of the release operation member, said device comprising:

(a) an auto-bracket selecting member for selecting an auto-bracket mode and operating independently from said bulb mode selecting member;

(b) an auto-bracket circuit for photographing a plurality of successive frames and for shifting the amount of exposure of each frame by a predetermined amount;

(c) a first designation circuit for designating said auto-bracket circuit in response to the operation of said auto-bracket selecting member to instruct the camera to photograph in the auto-bracket mode; and

(d) a prohibiting circuit for prohibiting said first designation circuit from responding to the operation of said auto-bracket selecting member when the bulb photographing mode is selected by the operation of said bulb mode selecting member.

13. A camera comprising:

(a) an auto-bracket mode setting operation member for setting an auto-bracket mode;

(b) an auto-bracket circuit for photographing a plurality of successive frames and for shifting the amount of exposure by a predetermined amount;

(c) a designation circuit for designating said auto-bracket circuit in response to the operation of said auto-bracket mode setting operation member to cause said auto-bracket circuit to perform auto-bracket photography;

(d) a film detection circuit for detecting the remaining amount of unexposed film in the camera and for outputting a film exhaustion signal when the unexposed film is

exhausted before the photographing of a predetermined number of frames is finished; and

(e) a reset circuit for cancelling the designation of the auto-bracket circuit by said designation circuit in response to the film exhaustion signal.

4,812,871

PHOTOGRAPHIC CAMERA

Nobuyuki Taniguchi; Yoshiaki Hata, both of Nishinomiya; Yoshinobu Kudo, Sakai; Manabu Inoue, Kobe; Takeo Hoda, Kawachinagano, and Hiroshi Ueda, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

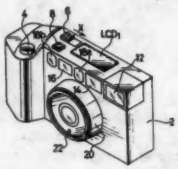
Division of Ser. No. 895,826, Aug. 12, 1986, Pat. No. 4,780,735.

This application Jun. 16, 1988, Ser. No. 206,706

Claims priority, application Japan, Aug. 29, 1985, 60-190520; Aug. 29, 1985, 60-190521; Aug. 29, 1985, 60-190522; Aug. 29, 1985, 60-190523; Aug. 30, 1985, 60-192621; Sep. 10, 1985, 60-201095; Sep. 10, 1985, 60-201096; Nov. 14, 1985, 60-255550; Dec. 19, 1985, 60-286732

Int. Cl.[4] G03B *7/095, 7/16, 17/24, 17/00*

U.S. Cl. 354—421 **3 Claims**



1. A photographic camera having a photographic lens, comprising:

means for selecting a real focal length photographing mode in which a normal range in a frame of a film will be printed on a photographing paper and a pseudo focal length photographing mode in which a range narrower than the normal range in a frame of the film will be printed on a photographing paper;

means for setting a close-up mode to effect a close-up photography;

means for setting an object distance of the photographic lens to a predetermined distance when the close-up mode is set; and

means for recording a signal indicating that the pseudo focal length photographing mode is selected when the close-up mode is set.

4,812,872

SMART FLASH CONTROL SYSTEM FOR CAMERAS

Stephen G. M. Desormeaux, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 13, 1988, Ser. No. 143,417

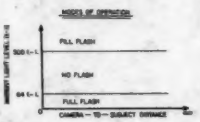
Int. Cl.[4] G03B *15/03*

U.S. Cl. 354—414 **5 Claims**

1. An improved artificial illumination control system for controlling the energization of an electronic flash device during a photographic exposure interval in a camera, wherein (a) light level detecting means provides a measure of the level of ambient light intensity and (b) flash triggering means for energizing said electronic flash device is operated in a full flash mode to enable a full flash exposure and is operated in a fill flash mode to enable a fill flash exposure, and wherein the improvement comprises:

comparator means for determining whether the measure of level of ambient light intensity provided by said light level detecting means is less than or equal to a first general brightness level which is too low for a proper daylight exposure, is greater than the first general brightness level but less than a second general brightness level which is substantially high as in bright sun, or is equal to or greater than the second general brightness level; and

control means, acting subsequent to said comparator means determining that said measure of the level of ambient light intensity is less than or equal to the first general brightness level, for operating said flash triggering means in its full flash mode, acting subsequent to said comparator means determining that said measure of the level of ambient light intensity is greater than the first general brightness level



but less than the second general brightness level, for preventing operation of said flash triggering means, and acting subsequent to said comparator means determining that said measure of the level of ambient light intensity is equal to or greater than the second general brightness level, for operating said flash triggering means in its fill flash mode, whereby a full flash exposure or a non-flash exposure or a fill flash exposure will automatically be selected in accordance with either one or two general brightness levels.

4,812,873

HEAT FIXING UNIT IN AN ELECTROPHOTOGRAPHIC COPYING APPARATUS

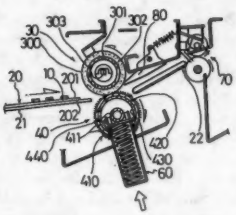
Sanji Inagaki; Hiroshi Fukao, both of Toyokawa; Tetsuya Yamada, Aichi; Etsuaki Urano, and Yoshihiro Hattori, both of Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 4, 1987, Ser. No. 93,314

Claims priority, application Japan, Sep. 9, 1986, 61-212424; Mar. 17, 1987, 62-38967

Int. Cl.[4] G03G *15/20*

U.S. Cl. 355—3 FU **10 Claims**



1. A heat fixing device used in an electrophotographic recording apparatus comprising:

a rotatable heat roller having heating means:

a rotatable pressure roller having a core and a plurality of fibers disposed on the periphery surface of said core; and

rings provided on the both ends of said pressure roller so as

to contact with said heat roller and comprising a resilient material for preventing the slip with respect to said heat roller.

4,812,874

IMAGE FORMING APPARATUS CAPABLE OF DESIGNATING AREA TO BE COPIED OF ORIGINAL

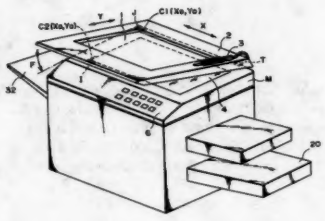
Atsushi Kubota, Machida; Nobukazu Sasaki, Tokyo; Toshirou Kasamura, Yokohama; Toshihiko Kusumoto, Tokyo; Tatsuya Shiratori, Yokohama; Takashi Ozawa, Ichikawa; Yasuyoshi Yamamoto, Tokyo; Michiro Koike, Kawasaki; Masashi Ohashi, and Akiyoshi Kimura, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 900,741, Aug. 27, 1986, abandoned. This application Jun. 13, 1988, Ser. No. 205,539

Claims priority, application Japan, Aug. 30, 1985, 60-191416

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—7 **25 Claims**



1. An image forming apparatus, comprising:

a main body including means for forming an image of an original;

transparent original placing means, disposed on an upper surface of said main body, for supporting the original thereon;

original pressing means movable between a closed position where said pressing means covers said original placing means and an open position where said pressing means is apart from said original placing means, wherein said original pressing means presses the original placed on said original placing means when at its colored position;

image are designated means disposed on said original pressing means, for designated an image area corresponding to an area on the image bearing surface of the original placed with the image bearing surface thereof facing upwardly;

first original placing position indicating means, provided on said original pressing means, for indicating a position for the original to be placed on said image area designating means for a designating operation; and

second original placing position indicating means for indicating a position for the original to be placed on said original placing means with its image bearing surface facing downward for an image forming operation.

4,812,875

ELECTROPHOTOGRAPHIC COPYING MACHINE HAVING AN EDITORIAL FUNCTION

Yoshihiro Tanimoto, Hyogo, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Filed Jun. 4, 1987, Ser. No. 58,357

Claims priority, application Japan, Jun. 5, 1986, 61-130577

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—7 **6 Claims**

1. An electrophotographic copying machine having an editorial function, comprising

position designating means for designating a position or positions whereto an image is to be moved;

an original table for placing an original;

an optical system for optically scanning the original placed on said original table;

moving means for relatively moving said original table and said optical system in accordance with the position or positions designated by said position designating means;

actually measuring means for actually measuring time necessary for forming a moved image copy during relative movement of said original table and said optical system, said actually measuring means including means for measuring said time while said original table and said optical

system are relatively and preliminarily moved by said moving means when only one moved image copy is to be formed, and means for measuring said time necessary for forming a succeeding moved image copy while a preceding moved image copy is formed when a plurality of moved image copies are to be formed in accordance with the same designated position or positions; and

image forming means for forming a moved image copy based on the time actually measured by said actually measuring means.

4,812,876

MOTOR CONTROL DEVICE FOR A COPYING MACHINE

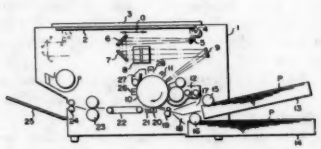
Yoshiaki Nawata, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 865,925, May 14, 1986, abandoned, which is a continuation of Ser. No. 576,422, Feb. 2, 1984, abandoned. This application Sep. 8, 1987, Ser. No. 96,258

Claims priority, application Japan, Feb. 4, 1983, 58-16992

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—14 R **6 Claims**



1. A motor control device for controlling a plurality of motors which are used to drive a plurality of movable components included in a copying machine and which are separately rotated, said device comprising:

key means for inputting first code information representing a motor-testing mode and second code information for designating any one of said plurality of motors to be checked, said key means including a first group of numerical keys for designating said motor to be checked and started, and a second group of numerical keys for designating said motor to be stopped; and

control means for controlling said any one of said plurality of motors to be checked which corresponds to the second code information, in response to the first code information and the second code information input by said key means,

said motor controlling means including means for converting each numerical data, keyed in by said first group of numeral keys, into a motor-driving command and also for converting each numerical data, keyed in by said second group of numerical keys, into a motor stopping command; and

said plurality of motors being mounted on the copying machine and comprising motors for driving a lens system and mirrors in order to vary the rate at which the image of a document is to be magnified and reduced, a motor for driving an exposure lamp and mirrors, in order to scan the document, a motor for driving a developer roller, a motor for driving a photoconductive drum, a motor for driving fusing roller means, paper conveyor belt and paper-discharging roller means, and a motor for driving a paper-feeding roller.

4,812,877

COPYING APPARATUS WITH MULTIPLE COPY MODES

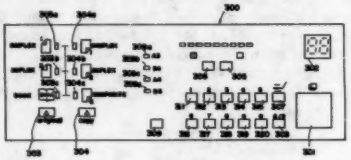
Kadotaro Nishimori, Toyokawa; Masazumi Ito, Toyohashi, and Masaaki Oyabu, Aichi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 11, 1987, Ser. No. 96,612

Claims priority, application Japan, Sep. 13, 1986, 61-216192

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 R **6 Claims**



1. A copying apparatus comprising:

means for handling original documents of various formats;

means for forming the image of an original document on a copy sheet in various formats;

a first key;

first select means for selecting one of said various document formats in response to the actuation of said first key;

a second key;

second select means for selecting one of said various copy formats in response to the actuation of said second key; said first select means selects one of said document formats irrespective of said second key, and said second select means selects one of said copy formats irrespective of said first key;

encode means for creating a copy mode code corresponding to a copy mode defined by said first select means and second select means, and

means for controlling said document handling means and said image forming means based on the copy mode code created by said encode means.

4,812,878

CLEANING APPARATUS FOR ELECTROPHOTOGRAPHY

Shozo Kaieda, Nagano, Japan, assignor to Kentex Information Systems, Inc., Allendale, N.J.

Filed Apr. 8, 1987, Ser. No. 36,018

Claims priority, application Japan, Dec. 1, 1986, 61-266649

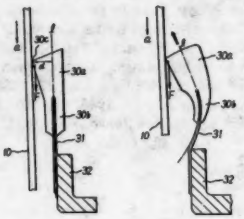
Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—15 **22 Claims**

1. A cleaning apparatus for removing residual toner from a rotatable charge image retentive member, comprising

an elastic cleaning blade for scraping residual toner from a recording region of said charge image retentive member, said elastic cleaning blade having a resilient leg portion and an elastically deformable cleaning edge projecting outward from said leg portion and toward said charge image retentive member, said cleaning edge being operative to be brought into contact with said charge image retentive member, and

an elastic supporting member for supporting said leg portion at a downstream position relative to the rotational direction of said charge image retentive member,



said leg portion being caused to curve away from said charge image retentive member while maintaining said cleaning edge in contact with said charge image retentive member when a frictional force is applied to said cleaning edge by the rotation of said charge image retentive member.

4,812,879

AUTOMATIC PHOTOGRAPHIC PRINTING APPARATUS WITH SIMULATOR AND METHOD OF ADJUSTING SIMULATOR OF AUTOMATIC PHOTOGRAPHIC PRINTING APPARATUS

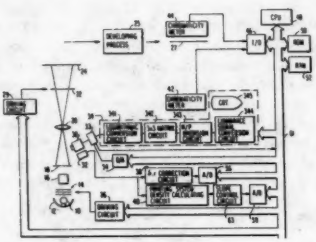
Kenji Suzuki, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 29, 1987, Ser. No. 79,069

Claims priority, application Japan, Jul. 29, 1986, 61-178293; Aug. 6, 1986, 61-184884; Aug. 6, 1986, 61-184886; Aug. 19, 1986, 61-193048; Sep. 16, 1986, 61-217643; Sep. 17, 1986, 61-218693; Sep. 26, 1986, 61-227378; Oct. 15, 1986, 61-245090; Nov. 26, 1986, 61-281536; Jun. 18, 1987, 62-152161

Int. Cl.[4] G03B *27/80*

U.S. Cl. 355—38 **24 Claims**



1. An automatic photographic printing apparatus in which light from a light source which undergoes a light adjustment conducted by an automatic exposure control function of said automatic photographic printing apparatus is irradiated onto a negative color film and photographic paper is exposed by the light transmitted through the negative film so as to optically form an image therein onto the photographic paper, said automatic photographic printing apparatus being provided with a simulator for displaying the image in the negative color film as a positive image, comprising:

an imaging device disposed on the side of said negative color

film spacedly from the light source for imaging the image in said negative color film on said side while said negative color film is being illuminated by said automatically adjusted light of the light source under said automatic exposure control function, said adjusted light being simultaneously used in both said printing apparatus for forming said image of the negative film on said photographic paper and said imaging device for simulating the image thereof;

a display device for displaying the image obtained, as a positive image by said imaging device;

an image information processing unit for electrically converting the output of said imaging device such that the coloring characteristics of said display device matches those of said photographic paper substantially and for causing said display device to display the results.

4,812,880

EXPOSURE APPARATUS

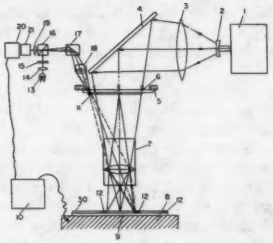
Kazufumi Ogawa; Masaru Sasago, both of Hirakata; Masayuki Endo, Izumi, and Takeshi Ishihara, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 29, 1987, Ser. No. 67,122

Claims priority, application Japan, Jul. 2, 1986, 61-155346

Int. Cl.[4] G03B *27/54, 27/42*

U.S. Cl. 355—53 **10 Claims**



1. An exposure apparatus for fabricating a semiconductor device from a wafer, said apparatus comprising:

an XY wafer stage for supporting the wafer;

an excimer laser means for emitting excimer laser light that travels along an optical path extending to the wafer supported on said stage whereby the wafer is exposed to the excimer laser light;

a reticle stage for supporting a reticle in said optical path between said excimer laser means and the wafer;

a reduction-projective lens disposed in said optical path and through which the excimer laser light passes before passing to the wafer; and

an alignment optical system for facilitating an alignment of the reticle with the wafer,

said alignment optical system including an alignment light source emitting alignment light having a wavelength of 300 nm~400 nm that travels along an optical path through the reticle to the wafer.

4,812,881

AUTOMATIC IMAGE-DENSITY CONTROL SYSTEM

Hidechika Kumamoto; Satoshi Kuroyanagi, both of Saksi, and Setsuo Hori, Izumi, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jan. 27, 1987, Ser. No. 6,843

Claims priority, application Japan, Jan. 31, 1986, 61-20877

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—77 **8 Claims**

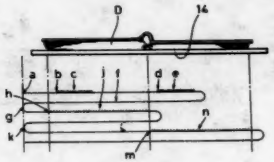
1. A method for automatically controlling image density in an electrophotographic copying machine have a continuous page copying mode and including an optical system having means movable in a forward direction for scanning and exposing an original and in a return direction for returning to a returned position, said method comprising the steps of:

(a) moving the movable means in the forward direction over a first portion of the content of a first page of an original;

(b) continuing forward direction movement of the movable means over a next portion of the content of the first page and sampling the content of the next portion of the first page to provide data representative thereof;

(c) moving the movable means further in the forward direction over a first portion of the content of a second page of the original before permitting the movable means to move in the return direction;

(d) continuing forward direction movement of the movable



means over a next portion of the content of the second page before permitting the movable means to move in the return direction and sampling the content of the next portion of the second page to provide data representative thereof;

(e) generating optimum values for controlling photocopying operations for the content of the first and second pages from the provided data;

(f) photocopying the first page while controlling the photocopying operation according to the generated optimum value corresponding to the content of the first page; and

(g) photocopying the second page while controlling the photocopying operation according to the generated optimum value corresponding to the content of the second page.

4,812,882

CONTRAST MONITOR

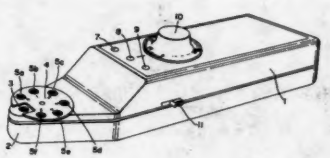
Richard J. Brent, Handforth, and Brian F. Moss, Chelford, both of England, assignors to Ciba-Geigy AG, Switzerland

Filed Sep. 18, 1987, Ser. No. 98,230

Claims priority, application United Kingdom, Oct. 14, 1986, 8624605; Dec. 17, 1986, 8630185

Int. Cl.[4] G03B *27/32*

U.S. Cl. 355—77 **13 Claims**



1. A method of determining the contrast grade of the paper to be used to print a black and white photographic negative which comprises placing a photocell in the darkest significant area of a projected negative image and noting an indication of the light received or calibrating the photocell so when the photocell receives light of the same level it will indicate this, then placing the photocell in the lightest significant area of the projected image of the negative and reducing the light reaching the photocell using graduated steps until the light reaching

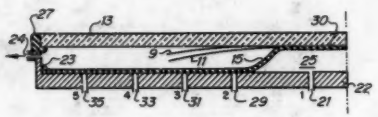
the photocell is of the same level as the light which reached the photocell when it was placed in the darkest significant area of the projected negative image and noting the step employed to achieve this equivalence and selecting the contrast grade of the paper which is indicated by the step which achieved equivalence.

4,812,883

GRAPHIC MATERIAL REGISTRATION APPARATUS AND METHOD

Ernest Ohlig, 2306 Holiday Rd., Newport Beach, Calif. 92660

Filed Dec. 10, 1987, Ser. No. 131,377
Int. Cl.[4] G03B 27/20
U.S. Cl. 355—91 **23 Claims**



1. Photographic exposure apparatus comprising:

a radiation transmissive platen disposed to support a photographic sheet in intimate registration with one surface for the exposure thereof to a source of radiation through the platen in a direction toward said one surface;

another platen spaced away from said one surface of the radiative transmissive platen;

a flexible, substantially gas-impervious membrane disposed intermediate said one surface of the radiation transmissive platen and said other platen and being sealed substantially about the peripheral boundary thereof with respect to one of said platens for forming a common boundary wall between two gas-impervious chambers and for receiving a sheet of photographic material intermediate said one surface of the radiation transmissive platen and the membrane;

gas inlet means coupled to the region within the peripheral seal of the membrane for selectively admitting gas into the region;

means coupled to the region between the membrane and said one surface of the transmissive platen for evacuating gas therefrom to urge the membrane toward said one surface of the transmissive platen in response to differential gas pressure on opposite surfaces of the membrane for supporting a sheet of photographic material in intimate surface registration with said one surface; and

resilient hold-down means disposed with respect to the other platen and the membrane for resiliently urging the membrane toward the other platen to promote flexure of the membrane toward the transmissive platen that migrates over said one surface thereof.

4,812,884

THREE-DIMENSIONAL DOUBLE AIR GAP HIGH SPEED SOLENOID

David B. Mohler, Tipp City, Ohio, assignor to Ledex Inc., Vandalia, Ohio

Filed Jun. 26, 1987, Ser. No. 66,496
Int. Cl.[4] H01F 7/08
U.S. Cl. 335—258 **6 Claims**

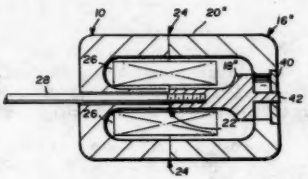
1. A three-dimensional double air gap solenoid, comprising:

a pole piece of magnetically permeable material including a pole central core protruding from a central region of said pole piece in a given direction and a pole peripheral portion protruding from a peripheral region of said pole piece in said direction;

an armature of magnetically permeable material including an armature central core protruding from a central region of said armature towards said pole central core and an armature peripheral portion protruding from a peripheral region of said armature towards said pole peripheral portion;

coil means, fixed relative to said pole piece, for producing a magnetic field, said coil means including means defining an opening therein, at least one of said pole central core and said armature central core at least partially located in said opening and said pole peripheral portion and said armature peripheral portion forming a sleeve at least partially surrounding said coil means;

said pole central core and said armature central core being substantially axially aligned with one another and spaced apart forming a central gap and said pole peripheral portion and said armature peripheral portion being substantially axially aligned with one another and spaced apart forming a peripheral gap, said central gap and said peripheral gap existing at least during de-energization of said solenoid;



means for permitting said armature to move relative to said pole piece in an operating direction so as to decrease said central gap and said peripheral gap; and

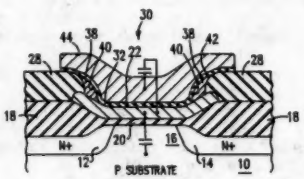
means for slideably mounting said armature central core in said armature peripheral portion, for movement in said operating direction and means for preventing movement of said armature central core with respect to said armature peripheral portion in a direction opposite said operating direction.

4,812,885

CAPACITIVE COUPLING

Bert R. Riemenschneider, Murphy, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 4, 1987, Ser. No. 81,424
Int. Cl.[4] H01L 29/78
U.S. Cl. 357—23.5 **12 Claims**



1. Integrated circuit structure with enhanced capacitance, comprising:

a first electrode having a surface with a peripheral region and a central region;

a first insulator layer covering said peripheral region and forming at least one sidewall extending upwardly from said surface and away from said central region;

a sidewall conductor layer physically coupled to said surface and overlying said sidewall for at least a portion of said sidewall's height, said sidewall conductor layer having a coupling surface;

a second insulator layer formed over said central region and said coupling surface; and

a second electrode formed adjacent said second insulator layer and substantially in registry with said coupling surface and said central region of said first electrode, such that a substantial capacitance is formed between said second electrode on the one hand and said sidewall conductor and said first electrode on the other.

4,812,886

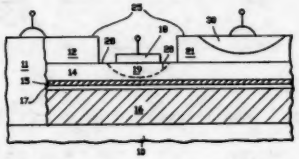
MULTILAYER CONTACT APPARATUS AND METHOD

Theoren P. Smith, III, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 9, 1987, Ser. No. 12,575

Int. Cl.[4] H01L *29/80*

U.S. Cl. 357—22 **12 Claims**



1. A semiconductor structure having a plurality of superimposed layers essentially parallel to an exposed surface having a separate ohmic contact to adjacent layers containing charge carriers comprising in combination:

a first high conductivity region extending through said surface to a conducting lower one of said layers, with respect to said surface.

a second high conductivity region separated from said first high conductivity region extending through said surface to a conducting upper layer adjacent said surface, and

carrier depletion control means positioned on said surface between said high conductivity regions and operable to deplete said upper layer of carriers whereby the lower layer and the upper layer are separately contacted between said first and second high conductivity regions.

4,812,887

CHARGE-COUPLED DEVICE

Arnoldus J. J. Boudewijns, Eindhoven, Netherlands, assignor to U. S. Philips Corporation, New York, N.Y.

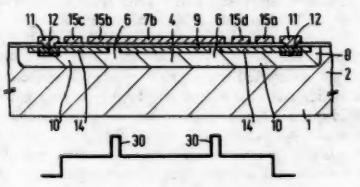
Continuation of Ser. No. 21,562, Mar. 3, 1987, abandoned, which is a continuation of Ser. No. 785,422, Oct. 8, 1985, abandoned.

This application Mar. 1, 1988, Ser. No. 165,429

Claims priority, application Netherlands, Oct. 12, 1984, 8403113

Int. Cl.[4] H01L *29/78*; G11C *19/28*

U.S. Cl. 357—24 **3 Claims**



1. A charge-coupled device of the buried channel type comprising a semiconductor body with a major surface and having a layer-shaped region which adjoins said surface, a charge transport channel in the form of a surface region of the first conductivity type in said layer-shaped region, an insulating layer on the upper side of said surface region, a semiconductor region of the second conductivity type on the lower side of said surface region which forms a pn junction with the charge transport channel, channel-bounding zones for bounding said surface region at its sides, a row of clock electrodes extending transversely throughout the width of the charge transport channel and on the insulating layer, and an input stage having an input zone of the first conductivity type and a supply conductor for supplying electrical signals thereto, further comprising means for substantially eliminating AC leakage currents during operation, said means including said channel-bounding zones which comprise layer-shaped regions of the same conductivity type as and having a lower doped concentration per unit surface area than the charge transport channel, the clock electrodes and the insulating layer extending above at least a part of the channel-bounding zones, the insulating layer having at least substantially the same thickness above the channel-bounding zones as above the charge transport channel and said channel-bounding zones having at least substantially the same thickness as that of said charge transport channel, and means for draining charge from said channel-bounding zones during operation and comprising highly-doped thin surface zones of said first conductivity type located alongside said channel-bounding zones and having at least one electrical connection, portions of said clock electrodes and said insulating layer extending above at least a part of said highly-doped thin surface zones.

4,812,888

SUSPENDED GATE FIELD EFFECT SEMICONDUCTOR PRESSURE TRANSDUCER DEVICE

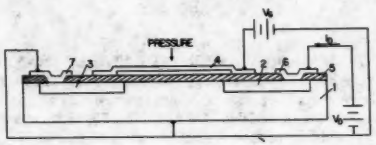
Gary F. Blackburn, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation of Ser. No. 668,444, Nov. 11, 1984, abandoned.

This application Apr. 7, 1987, Ser. No. 35,519

Int. Cl.[4] H01L *29/84, 29/96*

U.S. Cl. 357—26 **5 Claims**



1. A new and improved capacitive pressure transducer comprising:

a. field effect solid state electronic device having a semiconductor gate area which includes the semiconductor material directly beneath the gate element, an insulating layer, a gate element which is insulated from the gate area and capacitively coupled to the gte area so as to allow the formation of an inversion layer or channel in the semiconductor gate area in response to changes in potential or movement of the gate element, and at least two distinctly doped areas in the semiconductor gate area which are in direct electrical contact with said inversion layer;

b. said insulating layer being in direct contact with said semiconductor gate area;

c. said gate element being hermetically sealed along its perimeter with the said insulating layer, but separated therefrom elsewhere forming a sealed gap;

d. said gate element being made of conducting material and being constructed to move in response to pressure differentials on the two sides thereof so as to function as a diaphragm;

e. said gate element also being a conductor so as to change the capacitance between the said gate element and the semiconductor of said field effect solid state device and cause any change in the output of said solid state elec-

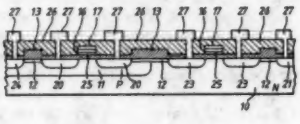
tronic device to be a measure of the change of the pressure.

4,812,889

SEMICONDUCTOR DEVICE FET WITH REDUCED ENERGY LEVEL DEGENERATION

Masakazu Kakumu, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 16, 1986, Ser. No. 908,028
Claims priority, application Japan, Sep. 24, 1985, 60-210423
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—42 **7 Claims**



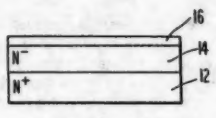
1. A semiconductor device comprising:
a semiconductor substrate of first conductivity;
a first impurity region of second conductivity which is formed on the substrate;
a second impurity region of the second conductivity which is formed in the substrate and spaced apart from said first impurity region;
a channel region located between the first and second impurity regions;
an insulation layer on the channel region; and
a gate electrode formed on the insulation layer, said gate electrode including conductive layer means for decreasing the temperature dependence of the semiconductor device, said layer means including a semiconductive layer containing the impurity ions of the second conductivity of levels less than $10^{16}/cm^3$ which are insufficient to cause an energy level degeneration thereof and a conductive layer formed on the semiconductive layer.

4,812,890

BIPOLAR MICROWAVE INTEGRATABLE TRANSISTOR

Anatoly Feygenson, Reading, Pa., assignor to Thompson-CSF Components Corporation, Montgomeryville, Pa.

Continuation of Ser. No. 799,419, Nov. 19, 1985, abandoned.
This application Apr. 22, 1987, Ser. No. 45,176
Int. Cl.[4] H01L *29/72, 29/04, 27/02*
U.S. Cl. 357—34 **8 Claims**



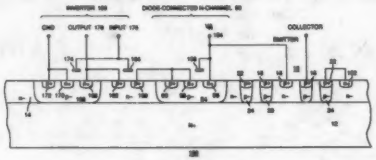
1. A semiconductor device having at least first and second transistors comprising:
a semiconductor substrate with a monocrystalline layer formed thereupon;
a first transistor region of the first transistor and a second transistor region of the second transistor disposed within portions of the monocrystalline layer;
a first base region formed of monocrystalline semiconductor disposed substantially above the first transistor region;
a second base region formed of monocrystalline semiconductor disposed substantially above the second transistor region and extending laterally substantially beyond the second transistor region forming an overhanging portion;
third and fourth transistor regions disposed substantially above the first and second base regions, respectively;
the first transistor region of the first transistor and the second base region of the second transistor being electrically coupled by way of the substrate, the monocrystalline layer, and the overhanging portion.

4,812,891

BIPOLAR LATERAL PASS-TRANSISTOR FOR CMOS CIRCUITS

David Bingham, San Jose, Calif., assignor to Maxim Integrated Products, Sunnyvale, Calif.

Filed Dec. 17, 1987, Ser. No. 133,958
Int. Cl.[4] H01L *29/72, 27/02;* H03K *3/26*
U.S. Cl. 357—35 **6 Claims**



1. A bipolar lateral pass-transistor for use in MOS integrated circuits, including
a semiconductor substrate having a substantially uniform doping of a first conductivity type,
an epitaxial layer on the surface of said substrate having a substantially uniform doping of said first conductivity type in a concentration lower than that of said substrate,
a first region of a second conductivity type, disposed in said epitaxial layer, having a first doping level, the depth of said region being less than the depth of said epitaxial layer,
a second region of said second conductivity type, spaced apart from and surrounding said first region and extending approximately the entire depth of said epitaxial layer, said second region having said first doping level at the surface of said epitaxial layer, and having a second doping level at a concentration substantially less then said first doping level, extending substantially through said epitaxial layer, and
a third region of said second conductivity type, spaced apart from and surrounding said second region and extending substantially through said epitaxial layer, having said doping level at the surface of said epitaxial layer, and having a second doping level at a concentration less then said first doping level, extending to the bottom of said epitaxial layer, said epitaxial layer exterior to said third region being capable of supporting MOS transistors without additional isolation.

4,812,892

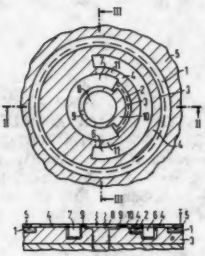
LIGHT CONTROLLABLE THYRISTORS

Peter Voss, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 30, 1978, Ser. No. 891,558
Int. Cl.[4] H01L *29/74*
U.S. Cl. 357—38 **4 Claims**

1. A light controlled thyristor comprising a semiconductor element which has a cathode area which receives light energy formed on one surface, a main emitter region and an auxiliary emitter region formed in said one surface and said auxiliary emitter region located between said cathode area and said main emitter region, said semiconductor element has a base layer region of thickness on said first surface which has a dopant concentration which decreases as a function of distance from said one surface, an auxiliary emitter electrode which contacts said base layer and said auxiliary emitter region (2) and separated by a groove (6) which separates the part of the auxiliary emitter electrode (4) which contacts said base layer in part of its circumference from said part which contacts said auxiliary

emitter, said groove extending into said base layer region and being at least as deep as said auxiliary emitter region, and a particular section of auxiliary emitter area (2) which carries the auxiliary emitter electrode (4) which contacts the base region (3) forms one or more bridges (11) which are at least on two sides terminated by said groove (6), and wherein said auxiliary



emitter region (2) and said groove (6) are designed in the form of a ring segment and that between the area (8) which is for light exposure and said base region (3) a second groove (7) is arranged in the form of a ring segment in such a fashion that the ends of the second groove (7) overlap with the groove (6) and the auxiliary emitter region (2) and wherein bridges (11, 11) are formed on both ends of said auxiliary emitter area.

4,812,893

TRIAC DESENSITIZED WITH RESPECT TO RE-STRIKING RISKS ON SWITCHING ACROSS A REACTIVE LOAD

Pierre Bacuvier, Luynes, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

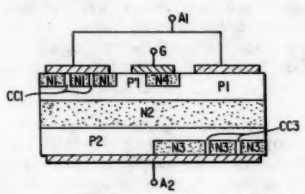
PCT No. PCT/FR86/00238, § 371 Date Mar. 18, 1987, § 102(e) Date Mar. 18, 1987, PCT Pub. No. WO87/00971, PCT Pub. Date Feb. 12, 1987

PCT Filed Jul. 4, 1986, Ser. No. 43,557

Claims priority, application France, Jul. 30, 1985, 85 11642

Int. Cl.[4] H01L *29/747*

U.S. Cl. 357—39 **4 Claims**



1. A triac including a semiconductor structure having an upper face covered with a first main electrode and a gate electrode, and a lower face covered with a second main electrode, and further comprising:

a type N central layer having an upper face side and lower face side;

a first P type layer covering said central layer on said upper face side,

a second P type layer covering said central layer on said lower face side,

a first N type region formed in a part of the first P layer and being flush with the upper face in this part whereas the first P layer is flush with the rest of the upper face, the first N type region being pierced with emitter short circuit holes through which the first P layer rises and is flush with the upper surface,

a second N type region formed in another part of the first P layer and being flush with the upper face in this other part,

a third N type region formed in a part of the second P layer and flush with the lower face in this part whereas the second P layer is flush with the rest of the lower face, the third N type region being pierced with emitter short circuit holes through which the second P layer comes flush with the lower face,

the first main electrode covering substantially the whole of the first N type region, including the short circuit holes of this first region, and covering a major flush part of the first P type layer, but not covering the first N type region and the first P type region in the immediate vicinity of the second N type region;

the gate electrode covering substantially the whole of the second N type region as well as a flush part of the first P type layer, this part being spaced apart from the major flush part of the first P type layer and being connected to this major part by a flush portion of the first P type layer, this portion surrounding the second N type region and not being covered by an electrode;

wherein, the gate electrode lies on top of three distinctive zones of superimposed semiconductor material;

the first zone is partially in line with said gate electrode and comprises said first P type layer whose said flush part interfaces said gate electrode, said type N central layer which interfaces and lies below said first P type layer, and said second P type layer which interfaces and lies below said type N central layer and whose flush part interfaces said second main electrode;

the second zone is partially in line with said gate electrode and comprises said second N type region whose flush part interfaces said gate electrode, said first P type layer which interfaces and lies below said second N type region, said type N central layer which interfaces and lies below said first P type layer, and said second P type layer which interfaces and lies below said type N central layer and whose flush part interfaces said second main electrode;

the third zone is partially in line with said gate electrode and comprises said second N type region whose flush part interfaces said gate electrode, said first P type layer which interfaces and lies below said second N type region, said type N central layer which interfaces and lies below said first P type layer, said second P type layer which interfaces and lies below said type N central layer, and said third N type region which interfaces and lies below said second P type layer and whose flush part interfaces said second main electrode.

4,812,894

SEMICONDUCTOR DEVICE

Tohru Nakamura, Tanashi; Kazuo Nakazato; Noriyuki Homma, both of Kokubunji; Kazuhiko Sagara, Tokyo; Takeo Shiba, Kodaira; Tokuo Kure, Kokubunji, and Tetsuya Hayashida, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 848,473, Apr. 7, 1986, abandoned. This application May 3, 1988, Ser. No. 191,761

Claims priority, application Japan, Apr. 8, 1985, 60-72681

Int. Cl.[4] H01L *29/06*

U.S. Cl. 357—55 **16 Claims**

1. 1 A semiconductor device comprising:

a semiconductor body of single crystal, having a first protruding portion, the first protruding portion having an upper surface and sides;

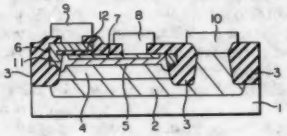
a first insulation film having a first opening, said first insulation film being located on said body such that said first opening exposes the upper surface of said first protruding portion;

a first semiconductor region, of a second conductivity type opposite to a first conductivity type, forming a part of said first protruding portion;

a second semiconductor region, of the first conductivity type, forming another part of said first protruding portion, the second semiconductor region being located on said first semiconductor region;

a second insulation film formed on said second semiconductor region;

at least one conductive layer formed in electrical connection with said first semiconductor region and extending from the electrical connection with the first semiconductor region to a location over said second insulation film on



said second semiconductor region, the at least one conductive layer being located so as not to be in direct contact with the second semiconductor region; and

first electrodes respectively provided in electrical connection with said at least one conductive layer, and a second electrode provided in electrical connection with the second semiconductor region, the first and second electrodes contacting the at least one conductive layer and the second semiconductor region, respectively, over the second semiconductor region.

4,812,895

HYPERFREQUENCY SEMICONDUCTOR DEVICE HAVING EXTERNAL CONNECTIONS ESTABLISHED BY BEAM-LEADS

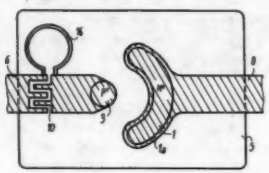
Ronald Funck, Port Marly, and Raymond Henry, Fondenay aux Roses, both of France, assignors to Thomson-csf, Paris, France

Continuation of Ser. No. 708,712, Mar. 6, 1985, abandoned. This application May 13, 1987, Ser. No. 51,215

Claims priority, application France, Mar. 16, 1984, 84 04103

Int. Cl.[4] H01L *23/48*

U.S. Cl. 357—69 **7 Claims**



1. A semiconductive device designed for operation at frequencies of millimeter wavelength comprising

a semiconductive chip having a substrate portion of one conductivity type and relatively low resisitivity, and a mesa portion supported on a limited region of the substrate portion and including a surface portion of conductivity type opposite that of the substrate and of relatively low resistivity and an intermediate portion between said surface portion and substrate portion and of relatively high resistivity;

dielectric means forming a cradle for the chip and having a top surface substantially coplanar with the top surface of the mesa portion of the chip, surrounding and contacting the sidewalls of the mesa portion of the chip, and including an opening for exposing a portion of the top surface of the substrate portion of the chip;

and a pair of beam leads supported on the top surface of the dielectric means of which one overlies the top surface of the mesa portion of the chip for making electrical connection thereto and the other extends through the opening in the dielectric means for overlying the exposed portion of the top surface of the substrate portion of the chip,

at least one of the two beam leads including means for forming a capacitance for series resonating with the inductance of the beams leads at the frequency designed for operation.

4,812,896

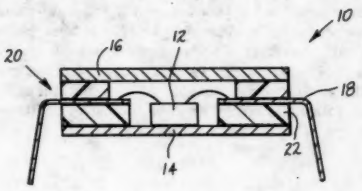
METAL ELECTRONIC PACKAGE SEALED WITH THERMOPLASTIC HAVING A GRAFTED METAL DEACTIVATOR AND ANTIOXIDANT

Eugene F. Rothgery, No. Branford; William W. C. Hart, Bethany; Edward F. Smith, III, Madison; Steven D. Phillips, Northford; Bonnie B. Sandel, Milford, and David F. Gavin, Cheshire, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Nov. 13, 1986, Ser. No. 930,162

Int. Cl.[4] H01L *23/48, 29/44, 29/52, 29/60*

U.S. Cl. 357—70 **8 Claims**



1. A package adapted for housing an electronic component, comprising:

a metallic base component;

a metallic lid component;

a leadframe disposed between said base component and said lid component;

a thermoplastic material sealing said leadframe between said lid and base components;

said thermoplastic material comprising a polyolefin having an additive, said additive consisting essentially of a metal deactivator and a primary antioxidant, said additive grafted to said polyolefin without cross linking so as to maintain thermoplastic properties.

4,812,897

SEMICONDUCTOR ELEMENT SEALING STRUCTURE

Ryoichi Narita, Obu; Toshio Sonobe, Okazaki; Hitoshi Ito, Kariya; Junji Ishikawa, Nagoya; Osamu Takenaka, Kariya, and Junji Sugiura, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Aichi, Japan

Continuation of Ser. No. 910,988, Sep. 24, 1986, abandoned. This application Sep. 1, 1987, Ser. No. 93,159

Claims priority, application Japan, Sep. 27, 1985, 60-215277

Int. Cl.[4] H01L *23/28, 23/02;* **B32B** *27/38, 9/04;* **C08F** *8/00, 283/00;* **C08G** *8/28*

U.S. Cl. 357—72 **14 Claims**

14. A semiconductor element sealing structure comprising:

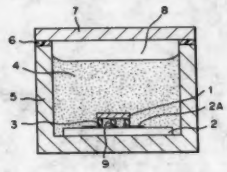
(a) a semiconductor element having electrodes on a main surface thereof;

(b) a substrate having conductive members formed on the substrate, the semiconductor element being mounted on the substrate by bonding the electrodes to the conductive members with solder bumps; and

(c) an addition reaction type silicone gel sealing at least the semiconductor element and also existing between the

semiconductor element and the substrate, said silicone gel having a complex modulus of elasticity

such that breakage of the bumps due to thermal fatigue occurs preferentially by shear stress thereto due to a difference between the thermal expansion coefficients of the semiconductor element and the substrate, not by tension thereto due to thermal expansion of the silicone gel between the semiconductor element and the substrate, and



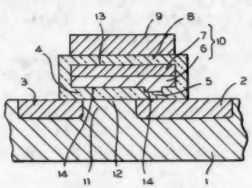
said silicone gel contains free vinyl groups and ethylene groups and the ratio of the free vinyl groups to the ethylene groups is such that an increased complex modulus of elasticity of the silicone gel after the free vinyl groups have been used to form cross linkages is still lower than the above-defined specific value of the complex modulus of elasticity.

4,812,898

ELECTRONICALLY PROGRAMMABLE AND ERASABLE MEMORY DEVICE HAVING FLOATING GATE ELECTRODE WITH A UNIQUE DISTRIBUTION OF IMPURITY CONCENTRATION

Naotaka Sumihiro, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jun. 20, 1986, Ser. No. 876,897
Claims priority, application Japan, Jun. 21, 1985, 60-135583
Int. Cl.[4] H01L *29/78, 29/04;* **G11C** *11/34, 7/00*
U.S. Cl. 357—23.5 **3 Claims**



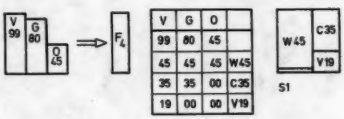
1. An electrically programmable and erasable memory device comprising a semiconductor substrate of one conductivity type, source and drain regions of the opposite conductivity type formed in a major surface of said substrate, a channel region positioned in said major surface of said substrate between said source and drain regions, a floating gate electrode made of polycrystalline silicon, a first gate insulating film positioned between said floating gate electrode and said major surface of said substrate, a second gate insulating film formed on said floating gate electrode, and a control gate electrode formed on said second gate insulating film, said first gate insulating film including a partially thin portion above a part of said drain region, and said floating gate being a double film structure including a first polycrystalline silicon film having a low impurity concentration and being attached at its bottom surface to said first gate insulating film including said thin portion, and a second polycrystalline silicon film having a higher impurity concentration than said first polycrystalline silicon film, said second polycrystalline silicon film being formed on said first polycrystalline silicon film and being attached at its upper surface to said second gate insulating film, said first and second polycrystalline silicon films having the same plan shape and overlying parts of said source and drain regions and entire parts of said channel region, whereby a sufficient amount of carriers can be stored in said floating gate electrode even after writing and erasing operations have been repeated more than 10^5 times.

4,812,899

PRINTING PROCESS WHERE EACH INCREMENTAL AREA IS DIVIDED INTO A CHROMATIC AREA AND AN ACHROMATIC AREA AND WHEREIN THE ACHROMATIC AREAS ARE PRINTED IN BLACK AND WHITE AND THE CHROMATIC AREAS ARE PRINTED IN COLOR SUB-SECTIONS

Harald Kueppers, Im Buchenhain 1, D-6070 Langen, Fed. Rep. of Germany

Continuation of Ser. No. 703,227, Jan. 29, 1985, abandoned. This application Dec. 19, 1986, Ser. No. 943,435
Int. Cl.[4] H04N *1/46*
U.S. Cl. 358—75 **9 Claims**



1. A reproduction for producing a multi-color printing on printing stock, wherein the multi-color printing is composed of a plurality of elemental areas to which ink is applied comprising the steps of dividing a picture surface into sub-surfaces of identical size, dividing every sub-surface into juxtaposed elemental areas so that each sub-surface has a chromatic component and an achromatic component so that a desired color nuance is obtained at a particular selected sub-surface, the chromatic portion of said sub-surface is further divided into juxtaposed rectangular sub-sections and each of said sub-sections being printed with only one color, printing the sub-sections of said elemental areas which form the chromatic component with a maximum of two of six chromatic printing inks, said inks comprising yellow, orange-red, magenta-red, violet-blue, cyan blue, green and black depending on the chromatic nuance which is to be produced, and printing so that the relative sizes of the white and black elemental areas are varied according to the achromatic component.

4,812,900

ORIGINAL READING APPARATUS WITH LIGHT SOURCE SWITCHING WITHOUT A SWITCHING CIRCUIT

Hidejiro Kadowaki; Akihito Hosaka, both of Yokohama, and Kenichi Matsumoto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 16, 1986, Ser. No. 919,378
Claims priority, application Japan, Oct. 17, 1985, 60-229894
Int. Cl.[4] H04N *1/46*
U.S. Cl. 358—75 **5 Claims**

1. An original reading apparatus comprising:

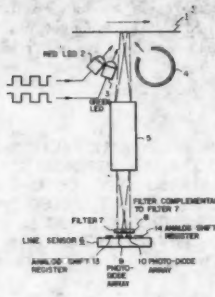
a line sensor having first and second sensor arrays each composed of a plurality of light receiving elements;

a first optical filter disposed on the light incident side of said first sensor array;

a second optical filter disposed on the light incident side of said second sensor array, said second optical filter being complementary in color to said first optical filter;

a first light source which, alternatingly, on and off during

line scans of an original so that the light is alternatively on or off for succeeding line scans; and



a second light source which continues to be turned on until an original scanning is completed.

4,812,901

PROBE APPARATUS

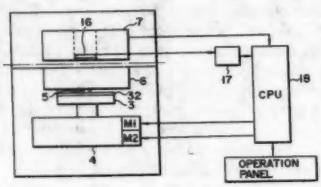
Wataru Karasawa, Yokohama, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

Filed Sep. 23, 1987, Ser. No. 100,199

Claims priority, application Japan, Sep. 30, 1986, 61-233480

Int. Cl.[4] H04N *7/00*

U.S. Cl. 358—101 **5 Claims**



1. A probe apparatus comprising:

means for moving a semiconductor wafer having a plurality of chips, said plurality of chips being arranged in patterns and said plurality of chips having a predetermined pitch;

measuring means for measuring an electric characteristic of each chip of said plurality of chips on said semiconductor wafer while said semiconductor wafer is being moved;

pattern recognition means for evaluating the patterns of said plurality of chips at at least two predetermined locations on said semiconductor wafer;

detecting means for detecting an arrangement pitch of said plurality of chips and for detecting a pitch at which said semiconductor wafer is moving along;

calculation means for calculating a difference between said arrangement pitch and said pitch at which said semiconductor wafer is moving along;

means for correcting said difference such that said arrangement pitch and said pitch at which said semiconductor wafer is moving along are identical.

4,812,902

METHOD AND APPARATUS FOR ADJUSTING COLOR SATURATION IN ELECTRONIC IMAGE PROCESSING

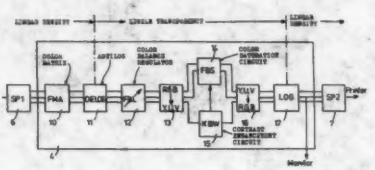
Hermann Fuchsberger, Ismaning, Fed. Rep. of Germany, assignor to AGfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 14, 1987, Ser. No. 85,864

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629469

Int. Cl.[4] G03F *3/08*; H04N *1/46, 9/64*

U.S. Cl. 358—80 **8 Claims**



1. Method of adjusting color saturation in electronic image processing, in which a two-dimensional original image is electro-optically scanned along rows and columns for three primary colors, R, G and B, image signals for the three primary colors are generated and said image signals are transformed into a luminance signal Y and two chrominance signals C1, C2, characterized in that a pre-selected adjustment of color saturation is used, in which, in accordance with a non-linear characteristic curve, small chrominance signals C1, C2 are amplified more than larger chrominance signals C1, C2 corresponding to a higher degree of saturation, said characteristic curve having a slope which decreases with increasing chrominance signal amplitude and said characteristic curve running horizontally beyond a predetermined boundary value of the chrominance signals C1, C2.

4,812,903

METHOD OF ELECTRONICALLY IMPROVING THE SHARPNESS AND CONTRAST OF A COLORED IMAGE FOR COPYING

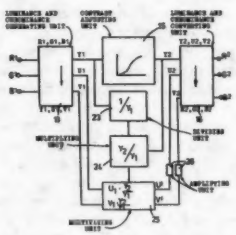
Eduard Wagensonner, Aschheim; Wolfgang Ruf, Munich; Hermann Fuchsberger, Ismaning, and Klaus Birgmeir, Putzbrunn, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 14, 1987, Ser. No. 85,942

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629396

Int. Cl.[4] G03F *3/08*; H04N *1/46, 9/64*

U.S. Cl. 358—80 **17 Claims**



1. A method of producing an image of a colored original, comprising the steps of scanning said original in each of the primary colors of red, green and blue; generating imaging signals for each primary color based on the scanning step; forming an unprocessed luminance signal and a pair of unpro-

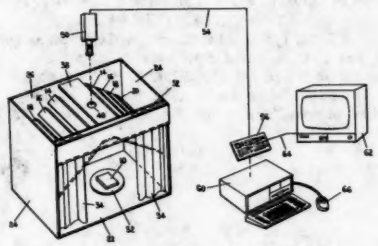
cessed chrominance signals from said imaging signals; processing said luminance signal to improve the sharpness of said image, the processing step including dividing said luminance signal into a higher-frequency portion and a lower-frequency portion, modifying said lower-frequency portion based on a non-linear function, amplifying said higher-frequency portion, and combining the modified lower-frequency portion and amplified higher-frequency portion to produce an enhanced luminance signal, said amplifying being performed using a greater amplification factor when the magnitude of said higher-frequency portion is less than a first predetermined magnitude and a smaller amplification factor when the magnitude of said higher-frequency portion exceeds said first predetermined magnitude; and processing at least one of said chrominance signals, including multiplying said at least one chrominance signal by a ratio obtained from said unprocessed and enhanced luminance signals, and amplifying said at least one multiplied chrominance signal, said amplifying of said at least one multiplied chrominance signal being performed using a greater amplification factor when the magnitude of said at least one multiplied chrominance signal is less than a second predetermined magnitude and a smaller amplification factor when the magnitude of said at least one multiplied chrominance signal exceeds said second predetermined magnitude, the step of processing said at least one chrominance signal further including maintaining the magnitude of said at least one amplified multiplied chrominance signal within a predetermined limit.

4,812,904

OPTICAL COLOR ANALYSIS PROCESS

Richard B. Maring, and Martin L. Shoemaker, both of Wyoming, Mich., assignors to Megatronics, Incorporated, Grandville, Mich.

Filed Aug. 11, 1986, Ser. No. 895,499
Int. Cl.[4] H04N 7/18
U.S. Cl. 358—107 **20 Claims**



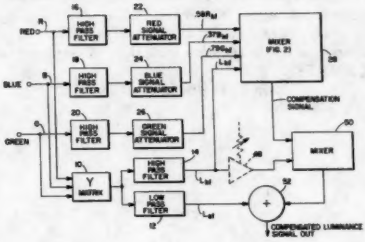
1. A process for analyzing colors in a viewing region in an object comprising illuminating the viewing region in predetermined light, scanning the viewing region with a video camera so as to produce an electronic video output for the color values at each pixel location representative of the viewing region, converting the video output into digital data for individual components of the colors, reporting and storing the digitized values in a computer memory, analyzing the digital component values to determine the means value of the component values and the extent of variation of component values from the mean value; and selecting a predetermined variation from the mean value as a tolerance limit for comparing other colors, the tolerance limit being determined as a function of the deviation of the component values from the mean.

4,812,905

SYSTEM FOR COMPENSATING FOR THE VIOLATION OF THE CONSTANT LUMINANCE PRINCIPLE IN COLOR TELEVISION SYSTEMS

John P. Rossi, 42 Arrow Head Dr., Stamford, Conn. 06902

Filed Jan. 15, 1988, Ser. No. 144,414
Int. Cl.[4] H04N 9/69
U.S. Cl. 358—32 **8 Claims**



1. In a color television system in which picture information is carried by means of a luminance signal and color difference signals and in which the luminance signal is generated by matrixing predetermined portions of full bandwidth gamma corrected first, second and third color signals, apparatus for compensating for the violation of the constant luminance principle that normally occurs when said luminance signal is generated with conventional matrices, said apparatus comprising:

compensation signal generating means having a plurality of inputs and a compensation signal output, for generating a compensation signal at said output in response to signals applied to said plurality of inputs;

means for applying signals containing only the frequencies of at least one of said first, second and third color signals higher than a selected crossover frequency of the frequency band of said color difference signals, each attenuated by a predetermined amount, to a respective input of said generating means,

means including means for matrixing said first, second and third color signals to produce a luminance signal and for applying the high frequencies of said luminance signal to a fourth input of said generating means;

said compensation signal generating means including selecting means for producing at its output a signal that corresponds at any given time to the highest positive-going transition and the highest negative-going transition of the applied signals when all input signal transitions have the same polarity and for producing at its output, when all input signal transitions do not have the same polarity, a signal equal to a linear combination of the highest positive or negative-going transitions of a given polarity and the highest positive- or negative-going transitions of signals having a polarity opposite from said given polarity; and

means for combining said compensation signal with the high frequencies of said luminance signal and producing a compensated high frequency luminance output signal, said combining means including selection means for producing, when the high frequency luminance transitions have the same polarity as the transitions of said compensation signal, an output signal which at any given time consists of the highest positive-going transition of said high frequency luminance signal or of said compensation signal and the highest negative-going transition of said high frequency luminance signal or of said compensation signal, and for producing, when the high frequency luminance transitions do not have the same polarity as the transitions of said compensation signal, an output signal which at any time consists of the algebraic sum of the

opposed polarity high frequency luminance transitions and the compensation signal transitions.

4,812,906

CIRCUIT ARRANGEMENT FOR FREQUENCY DIVISION

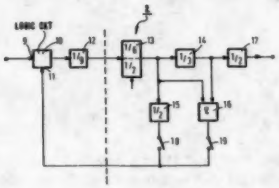
Jörg Wölber, Pinneberg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 20, 1987, Ser. No. 4,922

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1986, 3601858

Int. Cl.[4] H04N 5/04, 5/05, 9/79

U.S. Cl. 358—149 9 Claims



1. A circuit arrangement for a video recorder, for deriving a line-frequency signal from an input signal by means of a plurality of frequency dividers, comprising:

an input terminal for receiving the input signal, and

an output terminal for supplying the line-frequency signal, characterized in that a first section of the circuit arrangement comprises a first logic circuit having two inputs and one output, and a first frequency divider having a dividing ratio of 9, in that the input terminal is coupled to a first input of the logic circuit whose output is coupled to an input of the first frequency divider, in that the logic circuit is constructed to insert an edge into the signal present on the first input if an edge occurs in a signal on the second input of the logic circuit, in that a second section of the circuit arrangement, which section is coupled to an output of the first frequency divider, comprises a second frequency divider, and a third frequency divider having a dividing ratio of 3 and having its output coupled to the output terminal, in that a fourth frequency divider having a divider ratio of 2 is arranged in the signal path between the input terminal and the output terminal, and in that the following steps are applied separately or in combination,

(a) for the VHS-NTSC standard the output of the first frequency divider is coupled to a first input of an AND gate via the second frequency divider having a dividing ratio of 6 and to a second input of the AND gate via the third frequency divider, the output of said AND gate being coupled to the second input of the first logic circuit,

(b) for the VHS-PAL standard the output of the first frequency divider is coupled via the second frequency divider to the third frequency divider and the output of the second frequency divider is coupled via a fifth frequency divider having a dividing ratio of 2 to the second input of the first logic circuit,

(c) for the Video-8 NTSC standard the output of the first frequency divider is coupled to the third frequency divider via the second frequency divider having a dividing ratio of 7,

(d) for the Video-8 PAL standard the output of the first frequency divider is coupled, via the second frequency divider having a dividing ratio of 7 to the third frequency divider and the output of the second frequency divider is coupled via said fifth frequency divider having a dividing ratio of 2 to the second input of the first logic circuit.

4,812,907

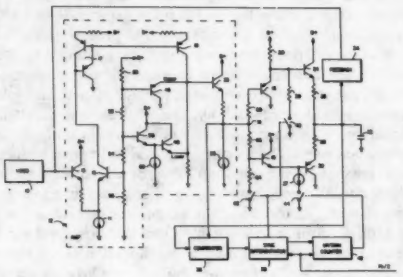
SYNC PULSE SEPARATOR SYSTEM

Roger C. Hathaway, Franklin Park, and Gopal K. Srivastava, Arlington Heights, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 31, 1987, Ser. No. 140,001

Int. Cl.[4] H04N 5/08

U.S. Cl. 358—153 11 Claims



1. A sync separator comprising:

a source of composite video signal including sync pulses having a sync tip voltage level and a back porch voltage level;

means establishing a voltage level intermediate said sync tip voltage level and said back porch voltage level;

said establishing means comprising means for charging a capacitor for the duration of a sync pulse to said sync tip voltage level and means for discharging said capacitor for ar equal time period after said sync pulse to said back porch voltage level; and

comparator means for separating sync pulses from said composite video signal based upon their relationship to said established voltage level.

4,812,908

AUTOMATIC GAIN CONTROL CIRCUIT HAVING A CONTROL LOOP INCLUDING A CURRENT THRESHOLD CIRCUIT

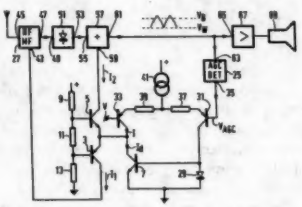
Vincentius T. M. Frequin, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 919,292, Oct. 15, 1986, abandoned. This application Apr. 7, 1988, Ser. No. 180,587

Claims priority, application Netherlands, Oct. 21, 1985, 8502861

Int. Cl.[4] H04N 5/52

U.S. Cl. 358—174 4 Claims



1. An automatic gain control circuit having a control loop for controlling a gain in said circuit in dependence on a signal level in said circuit, said control loop including means for varying said gain, a current threshold circuit for producing a control signal in said control loop for said varying means for controlling the gain, and means for detecting said signal level

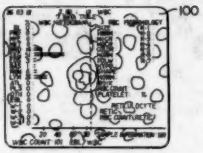
and for generating an input current for said current threshold circuit, said current threshold circuit comprising a first transistor; a second transistor having a conductivity type opposite to that of said first transistor; and a current source coupled, respectively, to emitters of said first and second transistors, for determining a threshold level of said current threshold circuit, said emitters receiving said input current indicative of said signal level and a collector of said first transistor providing a collector current for establishing said control signal, wherein, when said input current is below said threshold level, said collector current depends on said input current, and when said input current exceeds said threshold level, said collector current substantially does not depend on said input current.

4,812,909

CELL CLASSIFICATION APPARATUS CAPABLE OF DISPLAYING A SCENE OBTAINED BY SUPERIMPOSING A CHARACTER SCENE AND GRAPHIC SCENE ON A CRT

Toshiaki Yokobayashi; Ryohei Yabe, and Hajime Matsushita, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 31, 1987, Ser. No. 79,959
Claims priority, application Japan, Aug. 12, 1986, 61-189303
Int. Cl.[4] H04N *5/272, 5/262*
U.S. Cl. 358—183 **13 Claims**



1. An image display apparatus for simultaneously viewing data and image information concerning a sample to be measured, comprising:

a picture-scene signal generator means for generating a video image signal representing an image picture scene for displaying an image of the sample being measured;

a character-scene signal generator means for generating a video data signal representing a data character scene for displaying data regarding said sample, with the data correlated to the sample as it is when simultaneously appearing in said image;

adder means connected to said two signal generator means to superimpose the entire video image signal with the entire video data signal so that they do not interfere with each other thereby generating a sum video signal representing a superposed single scene; and

display means connected to said adder means to display said superposed single scene composed of the superposed entire image picture scene and entire data character scene each transparent to the other in response to the application of said sum video signal.

4,812,910

IMAGE REPRODUCING EQUIPMENT

Yutaka Komiya, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 937,505, Dec. 3, 1986, abandoned, which is a continuation of Ser. No. 219,976, Dec. 24, 1980, abandoned. This application Jul. 26, 1988, Ser. No. 224,257
Claims priority, application Japan, Dec. 29, 1979, 54-173544; Feb. 15, 1980, 55-17400
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—282 **51 Claims**

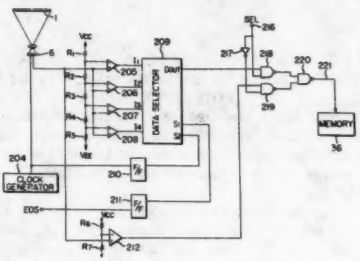
1. A copying machine comprising:

means for photoelectrically converting an original image;

means for generating reference density signals;

means for performing analog-to-digital conversion of a signal produced by said photoelectric conversion means based on reference signals from said reference density signal generating means;

threshold signal allotment means which generates threshold signals for performing a binary coding process on the signal converted by said A/D conversion means sequentially in synchronism with a picture element read by said photoelectric conversion means;



manual input means for selecting said threshold signal by controlling said threshold signal allotment means; and

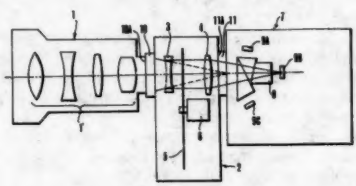
means for putting out a reproduced signal in accordance with the said selected threshold signal and the converted signal from said analog-to-digital conversion means in order to obtain a copy having a desired tone, wherein the binary coding process includes dither conversion of the image data to reproduce a half tone image.

4,812,911

ADAPTER WITH BUILT-IN SHUTTER

Shigeru Ohshima, and Takeshi Sekiguchi, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 20, 1987, Ser. No. 5,096
Claims priority, application Japan, Jan. 28, 1986, 61-010437
Int. Cl.[4] H04P *5/30*
U.S. Cl. 358—225 **16 Claims**



1. An adapter arranged to be attached between a camera body, which includes image converting means disposed at a position of an image forming plane to convert an image of an object into image information, and a first image forming lens system, for forming an image on the image forming plane, said adapter comprising:

(a) optical means, at least a part of which is disposed at a position on the first image forming lens system side of a predetermined image forming plane of the first image forming lens system, said optical means being arranged to relay a photographing bundle of rays, without forming an image therein, and then to form an image on the image converting means; and

(b) shutter means for applying intermittent exposures to the image converting means,

wherein said adapter and the first image forming system comprising a second image forming system.

4,812,912

FOCUS DETECTION CONDITION DISPLAY DEVICE FOR CAMERA

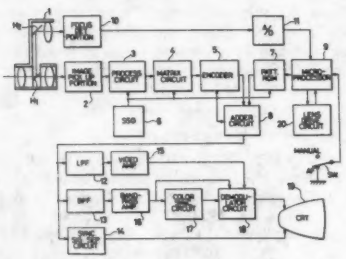
Takashi Iida, Kyoto; Masatoshi Itoh, Takatsuki; Hidenori Fukuoka, Toyonaka; Takeya Tsukamoto, Amagasaki; Masataka Hamada, Osaka; Kenji Ishibashi, and Hiroshi Ootsuka, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 18, 1987, Ser. No. 50,390

Claims priority, application Japan, May 26, 1986, 61-78186[U]; May 26, 1986, 61-7817[U]; May 26, 1986, 61-78188[U]; Jun. 25, 1986, 61-147193; Jul. 21, 1986, 61-169766; Jul. 21, 1986, 61-169767

Int. Cl.[4] G03B 3/00

U.S. Cl. 358—227 17 Claims



1. Focus detection condition display device for a camera, comprising:

means for measuring light coming from object to be photographed and passing through an optical lens to output first and second light signals indicative of the amount of the light incident on predetermined first and second focus detection zones respectively,

means for detecting the focusing condition of a photographic lens on the basis of at least one light signal out of the first and second light signals,

means for driving said photographic lens on the basis of the result of focus detection from said focusing condition detecting means,

a viewfinder indicating the range of an object field to be photographed,

display means which is provided in said viewfinder and having first and second display patterns corresponding to the first and second focus detection zones on which focus detection is conducted by said focusing condition detecting means,

judging means for judging whether focus detection by said focusing condition detecting means is possible or not, and

alarm means for issuing an alarm signal by means of the change of the display status of the display pattern displayed in said viewfinder by said display means then focus detection is judged to be impracticable.

4,812,913

DIAPHRAGM ARRANGEMENT FOR OPTO-ELECTRONIC SCANNING OF ORIGINALS

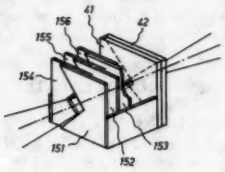
Hans-Georg Knop, and Jörg Schulz-Hennig, both of Heikendorf, Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Jan. 22, 1988, Ser. No. 147,321

Claims priority, application European Pat. Off., Jan. 24, 1987, 87100998.1

Int. Cl.[4] H04N 1/04

U.S. Cl. 358—285 12 Claims



1. A diaphragm arrangement for point-by-point, opto-electronic scanning of originals, whereby the scan point is composed of a central main field and of a surrounding field surrounding the main field, comprising a first diaphragm for scanning the main field, this first diaphragm being arranged within a scanning light beam reflected by the original or allowed to pass by the original and comprising a mirroring in the region around the diaphragm aperture at that side facing toward the scanning light beam, this mirroring reflecting a part of the scanning light beam, and comprising a second diaphragm for scanning the surrounding field, this second diaphragm being arranged within the part of the scanning light beam reflected by the first diaphragm, characterized in that the size of the diaphragm apertures of the two diaphragms are continuously adjustable independently of one another, whereby the diaphragm aperture of the first diaphragm defines the size of the main field and, thus, the scanning fineness and defines the inside diameter of the surrounding field, and the diaphragm aperture of the second diaphragm defines the size of the surrounding field, and whereby the size relationship between main field and surrounding field is continuously adjustable by independent adjustment of the two diaphragm apertures.

4,812,914

ELECTRONIC PRINT BOARD APPARATUS

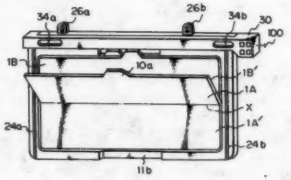
Minoru Isobe, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jun. 27, 1988, Ser. No. 212,224

Claims priority, application Japan, Dec. 27, 1985, 60-293052

Int. Cl.[4] H04N 1/10

U.S. Cl. 358—293 12 Claims



1. An electronic print board apparatus comprising:

(a) a writing unit having a writable/erasable writing surface;

(b) a frame housing and supporting said writing unit;

(c) a scanning unit supported movably on said frame for

optically scanning said writing surface in a prescribed direction and for thereby issuing an electric signal indicative of information read from said writing surface;

(d) a printing unit for printing the read information on a recording medium in conformity with said electric signal;

(e) said writing unit comprising a plurality of flat plates having surfaces capable of being written on, said plurality of flat plates being arranged in two stacks within respective portions of the interior of said frame, each said stack extending outwardly from said interior of said frame;

(f) said writing surface being formed by the two said flat plates located on the outermost front row of said two stacks; and

(g) each said flat plate of said plurality of flat plates being rotatable, when located in said front row, around a boundary axis dividing said two stacks, to move from one said stack to the other of said two stacks.

4,812,915

IMAGE READING APPARATUS WHICH ELIMINATES MOIRE PATTERNS BY MAGNIFYING AN IMAGE OPTICALLY AND REDUCING IT ELECTRICALLY

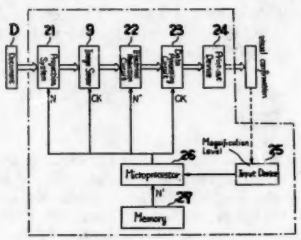
Kaoru Tada, Aichi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 27, 1987, Ser. No. 31,430

Claims priority, application Japan, Mar. 28, 1986, 61-72210

Int. Cl.[4] H04N *1/393, 1/04*

U.S. Cl. 358—287 **10 Claims**



1. An image reading apparatus capable of eliminating moire patterns, comprising:

an image sensor having a plurality of photoelectric elements aligned with each other for providing data of a document image;

a projection means for projecting a document image onto the image sensor at a selected one of a normal magnification value and at a varied magnification value;

means for processing the data of the document image provided by the image sensor;

means for indicating an occurrence of a moire pattern;

means, responding to the indicating means, for setting the projection means to project the document image onto the image sensor at the varied magnification value; and

means, responding to the indicating means, for enabling the data processing means to electrically reduce the data of the document image by an amount corresponding to the varied magnification value.

5. In an image reader for reproducing indicia on a document, the improvement comprising:

means for optically projecting an image of indicia of a document, the indicia being arranged on the document at a certain density;

means for converting the optically-projected image into electrical signals;

means for magnifying the optically-projected image prior to its conversion into electrical signals; and

means for processing the electrical signals of the magnified optically-projected image to compensate for the magnification of the optically-projected image whereby spurious noise resulting from a difference between the density of the indicia and a reading density of the image reader is reduced.

4,812,916

VISUAL MONITORING DEVICE WHICH PROJECTS AN IMAGE OF A REGISTER MARK ONTO A SCANNING SURFACE FOR USE IN SETTING IMAGE PROCESSING CONDITIONS

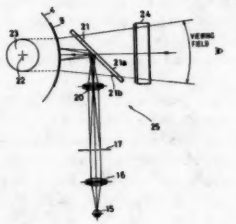
Hiroshi Iwamoto; Yutaka Tamura; Yuji Mizuno, and Akihiro Yokota, all of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Mar. 27, 1987, Ser. No. 30,997

Claims priority, application Japan, Mar. 31, 1986, 61-74613

Int. Cl.[4] H04N *1/06, 1/028*

U.S. Cl. 358—289 **3 Claims**



1. In an image scanning and processing apparatus, a visual monitoring device for visually observing a portion of a scanning surface of the apparatus for calibrating image processing parameters used for scanning and processing an image, said device comprising:

means for projecting light including an image of a register mark onto a portion of said scanning surface; and

means for magnifying said image of the mark and an area peripheral to said image on said scanning surface so that the portion of the scanning surface may be observed by an operator as a magnified image.

4,812,917

DEVICE FOR REDUCING DOCUMENT IN SIZE HAVING TWO FACING NON-PARALLEL MIRRORS

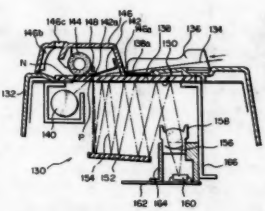
Shigeru Suzuki, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 20, 1987, Ser. No. 28,597

Claims priority, application Japan, Mar. 20, 1986, 61-63608; Mar. 25, 1986, 61-66652; Mar. 26, 1986, 61-67699

Int. Cl.[4] H04N *1/10, 1/04;* G03G *15/28*

U.S. Cl. 358—293 **13 Claims**



1. A device for reading an image of a document, which is to be reduced in size, by projecting said image in a reduced size onto a photoelectric transducer, comprising;

a pair of flat mirrors for reflecting a plurality of times therebetween a beam which is propagated along an optical path extending between said document and said photoelectric transducer, said pair of flat mirrors comprising a first mirror and a second mirror which are located to face each other; and

an image-forming lens located in an output position where said beam repetitively reflected between said flat mirrors leaves said mirrors, said lens projecting said beams onto said photoelectric transducer in a reduced size;

said first and second mirrors being slightly inclined relative to a parallel relationship thereof such that a distance between said mirrors is greater at said output position than at an input position where said beam arrives at said mirrors.

10. A device for reading an image of a document which is to be reduced in size, by projecting said image in a reduced size onto a photoelectric transducer, comprising:

a pair of flat mirrors for reflecting a plurality of times therebetween a beam which is propagated along an optical path extending between said document and said photoelectric transducer, said pair of flat mirrors comprising a first mirror and a second mirror which are located to face each other;

an image-forming lens located in an output position where said beam repetitively reflected between said flat mirrors leaves said mirrors, said lens projecting said beam onto said photoelectric transducer in a reduced size; and

a flat transparent base plate which has a document transport surface where said document is subjected to slit-type illumination;

said first mirror comprising a reflective film which is provided on a pair of a surface of said transparent base plate opposite to said document transport surface.

4,812,918

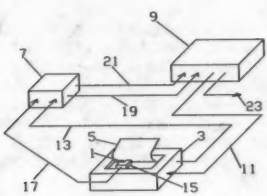
METHOD AND APPARATUS FOR SCANNING AND DIGITIZING OPTICAL IMAGES

Anthony K. Carbone, Rte. 1, Box 250, Bluemont, Va. 22012

Continuation-in-part of Ser. No. 403,425, Jul. 30, 1982, Pat. No. 4,525,743. This application Jun. 20, 1985, Ser. No. 746,638

Int. Cl.[4] H04N *1/024*

U.S. Cl. 358—293 **33 Claims**



1. An apparatus for opto-electrically scanning and digitizing an image on the surface of an image-bearing medium comprising:

(a) a single sensor for sensing the optical intensity levels of the image-bearing medium, the sensor being adapted for continuous linear movement during scanning across the image-bearing medium for producing an output signal representative of the scanned image;

(b) sampling means cooperating with the sensor for sampling its output signal at predetermined intervals of time to provide a digitized representation of the scanned image; and

(c) means for processing the output of the sampling means into a bit-mapped representation of the scanned image.

4,812,919

FIELD/FRAME CONVERSION CIRCUIT

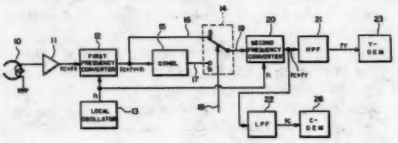
Yoshiki Iwase, and Yasuhito Kobayashi, both of Tokyo, Japan, assignors to Fuji Photo Film Co. Ltd., Kanagawa, Japan

Filed May 7, 1987, Ser. No. 46,710

Claims priority, application Japan, May 8, 1986, 61-105749; May 8, 1986, 61-105750; May 8, 1986, 61-105753; May 8, 1986, 61-105754; Aug. 4, 1986, 61-182963

Int. Cl.[4] H04N *5/76, 9/79*

U.S. Cl. 358—310 **4 Claims**



1. A field/frame conversion circuit for a video recording/reproducing apparatus, comprising:

frequency conversion means for converting a video field signal from a first frequency bandwidth to a higher second frequency bandwidth;

signal delay means for delaying the converted video field signal by 0.5 of a horizontal scan period; and

signal switching means coupled to receive said delayed video field signal and said converted video field signal for alternately outputting said delayed video field signal and said converted video field signal for each of a plurality of successive vertical scan periods to form a video frame signal.

4,812,920

WIDE BAND VIDEO SIGNAL RECORDING APPARATUS

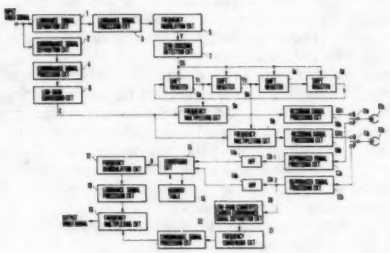
Yoshitake Nagashima; Hisashi Ishikawa, both of Kanagawa; Susumu Kozuki, Tokyo; Katsuji Yoshimura, Kanagawa; Koji Takahashi, Kanagawa, and Kenichi Nagasawa, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 1, 1987, Ser. No. 68,959

Claims priority, application Japan, Jul. 7, 1986, 61-159480; Jul. 25, 1986, 61-174974; Jul. 25, 1986, 61-174975; Dec. 12, 1986, 61-297422; Dec. 22, 1986, 61-305892; Dec. 23, 1986, 61-306865

Int. Cl.[4] G11B *5/02;* **H04N** *9/79*

U.S. Cl. 358—310 **28 Claims**



1. A video signal recording apparatus, comprising:

(a) separating means for separating a luminance signal and a carrier chrominance signal from an incoming video signal;

(b) modulating means for angle modulating said luminance signal separated by said separating means;

(c) channel dividing means arranged to form first and second recording luminance signals by frequency dividing at

different phases the angle modulated luminance signal modulated by said modulating means;

(d) converting means for converting the carrier wave of said carrier chrominance signal separated by said separating means to the low band of said first and second recording luminance signals;

(e) multiplexing means arranged to form first and second recording signals by multiplexing said low band converted carrier chrominance signal converted by said converting means with at least one of said first and second recording luminance signals; and

(f) recording means for recording said first and second recording signals simultaneously on a recording medium.

4,812,921

SOUND FIELD EXPANSION SYSTEM FOR A VIDEO TAPE RECORDER

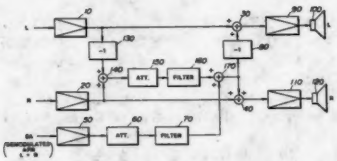
Takamichi Mitsuhashi, Saitama, and Masao Tomioka, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 24, 1986, Ser. No. 933,915

Claims priority, application Japan, Dec. 18, 1985, 60-285296

Int. Cl.[4] H04N *5/782;* **H04R** *5/00*

U.S. Cl. 358—343 **17 Claims**



12. A sound field expansion system, comprising:

(a) a first adder for adding both first and second audio signals derived from a recording and reproducing apparatus, the second audio signal being delayed by a predetermined interval of time with respect to the first audio signal, the first adder providing a two-channel comb filter characteristic to said added first and second audio signals;

(b) a phase shift circuit for shifting the phase of the first audio signal, the phase shift circuit being constituted by an inverting amplifier; and

(c) a second adder for adding the output signal of the phase shift circuit and the second audio signal.

4,812,922

STILL VIDEO SIGNAL PLAYBACK APPARATUS WITH STILL VIDEO RECORDING FUNCTION

Nobuo Minoura, Yokohama, and Katsuo Nakadai, Tokyo, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 15, 1987, Ser. No. 50,322

Claims priority, application Japan, May 16, 1986, 61-110564; May 16, 1987, 61-110565

Int. Cl.[4] H04N *5/781*

U.S. Cl. 360—10.1 **5 Claims**

1. A still video signal playback apparatus having a magnetic head transfer device for supporting a magnetic head which is movable radially of a rotating magnetic recording medium on which are provided a plurality of circular, concentrically arranged tracks, and for moving the magnetic head a predetermined amount in a predetermined direction, and a playback processing circuit for processing a still video signal read from the magnetic recording medium by the magnetic head and outputting the processed still video signal to an output terminal as a still video signal, said apparatus comprising:

a recording processing circuit for processing a video signal supplied to an input terminal and outputting a still video signal for recording;

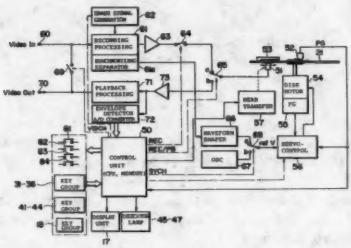
a first switch for setting an ordinary recording mode;

a second switch for setting a recording review mode;

a changeover switching circuit for selectively connecting the magnetic head to an input side of said playback processing circuit and an output side of said recording processing circuit;

recording control means responsive to a switching input from either of said first and second switches for controlling said changeover switching circuit in such a manner that the magnetic head is connected to the output side of said recording processing circuit at a predetermined timing;

first transfer control means responsive to a switching input from said first switch for executing control in such a



manner that said magnetic head transfer device is driven to move the magnetic head one track in a predetermined direction after recording under control of said recording control means ends;

review control means responsive to a switching input from said second switch for controlling said changeover switching circuit in such a manner that the magnetic head is connected to the input side of said playback processing circuit for a predetermined period of time after recording under the control of said recording control means ends; and

second transfer control means for executing control in such a manner that said magnetic head transfer device is driven to move the magnetic head one track in a predetermined direction after playback for a predetermined period of time ends following changeover to the playback side by said review control means.

4,812,923

TAPE INSPECTION APPARATUS

Frank S. Fountain, Wilmington, Del.; Donald K. Pusey, West Grove, Pa., and Keith A. McCloy, Chillicothe, Ohio, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 759,846, Jul. 29, 1985, Pat. No. 4,686,563, which is a continuation-in-part of Ser. No. 673,767, Nov. 21, 1984, abandoned. This application Jun. 4, 1987, Ser. No. 58,210

The portion of the term of this patent subsequent to Aug. 11, 2004, has been disclaimed.

Int. Cl.[4] G11B *27/36;* **H04N** *5/782*

U.S. Cl. 360—25 **9 Claims**

1. In an apparatus including a dropout detector connected to a helically scanned magnetic tape player, the improvement comprising provision of

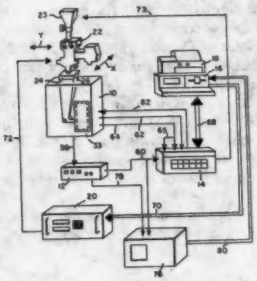
a positionable tape-inspecting instrument located adjacent the player,

guide and transport elements for diverting tape from its normal path of advance into and through a path where it can be inspected by said instrument,

a device for positioning the instrument, and

means interfaced with the detector, player and device for

computing data, based on information recorded on the tape, as to the locations of dropouts, controlling tape



advance and, with said data, positioning the instrument at the location of any detected dropout.

4,812,924

METHOD AND APPARATUS FOR REPRODUCING OR RECORDING A PCM SIGNAL AND SUB DATA CONCERNING THE PCM SIGNAL IN A PAIRED FORMAT

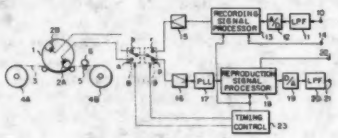
Tadashi Fukami; Shinya Ozaki, both of Kanagawa, and Kentaro Odaka, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 9, 1987, Ser. No. 23,479

Claims priority, application Japan, Mar. 11, 1986, 61-52943

Int. Cl.[4] G11B *20/10*

U.S. Cl. 360—32 **10 Claims**



1. A method of transmitting a digital signal, incldluing a PCM signal and sub data representing control data, reproduced by a tape recorder having rotary heads, comprising the steps of:

deriving the PCM signal from the sigal reproduced by the rotary heads;

deriving the sub data from the signal reproduced by the rotary heads; and

serially transmitting each of a predetermined number of words of the reproduced PCM signal and each symbol of the reproduced sub data as a pair synchronously with the rotation of the rotary heads.

4,812,925

METHOD AND ARRANGEMENT FOR DROP-OUT COMPENSATION DURING THE REPRODUCTION OF MAGNETICALLY RECORDED SIGNALS

Christian Opelt, Tannenstrasse 12, D-8501 Veitsbronn, Fed. Rep. of Germany

Filed Sep. 2, 1987, Ser. No. 92,338

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1986, 3630179

Int. Cl.[4] H04N *5/78*

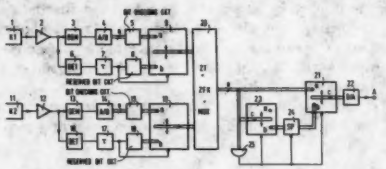
U.S. Cl. 360—38.1 **19 Claims**

1. A method of drop-out compensation during the reproduction of magnetically recorded signals, which are reproduced from several tracks of a record carrier, comprising the steps of

producing an identification signal in each channel by evaluation of the signal reproduced, which identification signal indicates whether a drop-out occurs or does not occur,

correcting the signals in digital form with respect to time errors and combining the corrected signals into a monochannel signal,

in the case of a drop-out, inserting the output signal of a drop-out memory instead of the disturbed signal part into the monochannel signal corrected with respect to time errors,



in each channel, reserving at least one bit combination of the digital signal exhibiting time errors for the transmission of the identification signal,

correcting the digital signal comprising the identification signal with respect to time errors, and

controlling the drop-out memory by the identification signal corrected with respect to time errors.

4,812,926

AUTOMATIC TRACKING DEVICE FOR VCR WITH CAPSTAN MOTOR CONTROLLED BY COLOR SIGNAL

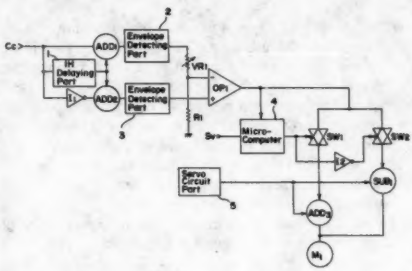
Jin S. Jeon, Kyunggi, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed May 22, 1987, Ser. No. 53,118

Claims priority, application Rep. of Korea, May 22, 1986, 1986-4011

Int. Cl.[4] G11B *15/467*; H04N *9/79*

U.S. Cl. 360—70 **1 Claim**

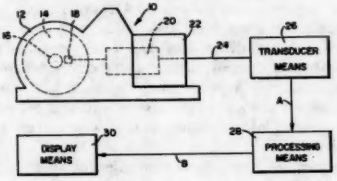


1. An automatic VCR tracking device comprising a color signal input terminal (C_c) connected directly to an input terminal on one side of a first adder (ADD_1) and through an inverter (I_1) to an input terminal on one side of a second adder (ADD_2) and, at the same time, to the other input terminals of both said first and second adders (ADD_1, ADD_2) through a IH delaying part (1), the output terminal of the first adder (ADD_1) being connected to the reversing input of a differential amplifier (OP_1) through a first envelope detecting part (2) and variable resistance (VR_1), the output terminal of the second adder (ADD_2) being connected to the non-reversing input of said differential amplifier (OP_1) through a second envelope detecting part (3), the output terminal of the differential amplifier (OP_1) being connected to a microcomputer (4) and, at the same time, to the first input terminals of a third adder (ADD_3) and a subtractor (SUB_1) through analog switches (SW_1, SW_2) which are controlled by said microcomputer (4), and whose second input terminals are connected to the output terminal of a servo circuit part (5), the output terminals of said third adder (ADD_3) and said subtractor (SUB_1) being connected to a capstan motor.

4,812,927
HEAD-TO-DISK INTERFERENCE DETECTOR

Jimmy R. Fechner, Broomfield, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Nov. 5, 1987, Ser. No. 117,632
Int. Cl.[4] G11B 21/02
U.S. Cl. 360—75 26 Claims

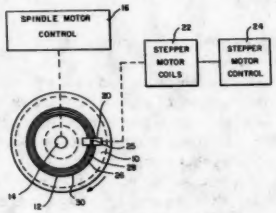


1. In a disk drive system, the combination comprising:
a head/disk assembly including a plurality of rotatable disks, a plurality of radially movable heads cooperating with said disks for transfer of data therebetween, and carriage means for supporting said heads;
means, coupled to said carriage means, for conducting acoustic stress waves therefrom, said acoustic stress waves corresponding to vibrations caused by a mechanical interaction within the disk drive system;
transducer means, coupled to said conductinq means, for sensing said acoustic stress waves and for outputting a first signal which is proportional thereto;
processing means connected to receive said first signal for determining a degree of mechanical interaction, said processing means outputting a second signal; and
means for displaying said second signal.

4,812,928
STEPPER MOTOR DATA RECOVERY METHOD USING A MAGNETIC HYSTERESIS BASED STEPPING ALGORITHM

James N. Krause, Morgan Hill, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Aug. 14, 1987, Ser. No. 85,117
Int. Cl.[4] G11B 5/55, 5/56
U.S. Cl. 360—78.08 6 Claims

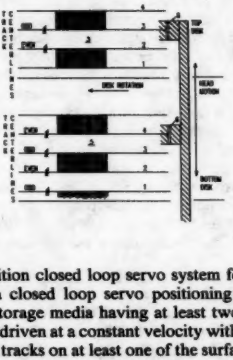


1. A computer disc drive system comprising at least one disc having a plurality of concentric data tracks thereon,
means for rotatably supporting said disc,
means comprising an actuator for supporting a transducer over said disc for reading and writing digital information on said disc tracks, said system having positioning means for selectively positioning said transducer in alignment with one of said data tracks as a target track on said rotating disc for reading and writing data,
open loop position means coupled to said actuator comprising a multi-phase stepper motor for moving said actuator and thereby said transducer from or over an initial track spaced from said target track to said target track, and
data recovery means for energizing the phases of said motor in a sequence that will establish a magnetic memory error in at least one of said phases in moving said transducer from said initial track toward a data recovery position displaced from said alignment with said target track, wherein data recovery can be effected, said data recovery means comprising means for selectively energizing a plurality of said phases of said motor to move said transducer to said initial track and for de-energizing one of said phases as said transducer is moved to said target track to produce said memory error, said de-energized phase acting as a memory error phase, power means for reversing the energization of said memory error phase which is to be de-energized at said target track, and braking means for re-energizing said memory error phase while slowing the movement of the transducer toward said target track, wherein the magnetic memory of the de-energized memory error phase at the target track is established, causing said transducer to off-track relative to said alignment with the target track at the data recovery position.

4,812,929
HEAD POSITIONING MECHANISM FOR ROTATING DISK DATA STORAGE SYSTEM

Alexander Stewart; Duncan S. Furness, and Sham P. Bhatia, all of Boca Raton, Fla., assignors to Rodime PLC, Glenrothes, Scotland

Continuation of Ser. No. 799,595, Nov. 19, 1985, Pat. No. 4,638,384. This application Oct. 30, 1986, Ser. No. 924,954
The portion of the term of this patent subsequent to Jan. 20, 2004, has been disclaimed.
Int. Cl.[4] G11B 5/596
U.S. Cl. 360—77.07 20 Claims



1. A fine position closed loop servo system for use in conjunction with a closed loop servo positioning system for a magnetic disk storage media having at least two data storage disks rotatingly driven at a constant velocity with a plurality of concentric data tracks on at least one of the surfaces of each of said data storage disks, at least one data transducer associated with an in close proximity to each of said data storage disks, said data transducers being mounted to a common head mounting structure for movement by driver means across said plurality of concentric tracks on each of said at least two data storage disks, comprising:
first servo burst signals on a surface of a first of said at least two data storage disks, said first servo burst signals beng recorded on said first data storage disk at radial positions one-half track displaced uniformly from the even numbered concentric track centerlines;
second servo burst signals on a surface of another of said at least two data storage disks, said second servo burst signals being recorded at radial positions one-half track displaced uniformly from the odd numbered concentric track centerlines;
means for simultaneously enabling the data transducers associated with the surfaces of said at least two data stor-

age disks containing said first and second servo burst signals for reading said servo burst signals; and

means for processing said first and second servo burst signals to generate a position error sigal for application to said driver means for promoting and maintaining track centerline alignment of an enabled data transducer during operation of said magnetic disk storage means.

4,812,930

TAPE GUIDE ARRANGEMENT FOR A HELICAL SCAN TYPE MAGNETIC RECORD REPRODUCTION DEVICE

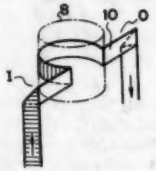
Haruo Sakata, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Feb. 20, 1987, Ser. No. 18,101

Claims priority, application Japan, Mar. 6, 1986, 61-49888

Int. Cl.[4] G11B *15/61*

U.S. Cl. 360—84 **13 Claims**



1. In a magnetic recording reproduction device, in which signals are recorded/reproduced on a magnetic tape by means of at least two heads provided on a drum rotated by a motor, the magnetic tape being supported for lengthwise movement and extending around a portion of said drum, the improvement comprising wherein a rotation axis of said drum is disposed substantially parallel to a base plate of said device, including first means for bending a portion of the tape traveling to said drum in a first direction extending substantially parallel to said rotation axis of said drum approximately by 90° so that it is traveling in a second direction approximately normal to said first direction and for then twisting the tape approximately by 90° so that it is traveling in a third direction approximately normal to said second direction, the tape then traveling around said portion of said drum, and including second means for twisting the tape from said drum which is traveling in a fourth direction approximately by 90° so that it is traveling in a fifth direction approximately normal to said fourth direction and for then bending the tape approximately by 90° so that it is traveling in a sixth direction approximately normal to said fifth direction.

4,812,931

ARRANGEMENT FOR SETTING AND DISCHARGING OF A CASSETTE IN ELECTRONIC STILL CAMERA

Narito Shibaike, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 29, 1986, Ser. No. 924,490

Claims priority, application Japan, Nov. 1, 1985, 60-246570; Nov. 1, 1985, 60-246574; Nov. 1, 1985, 60-246575

Int. Cl.[4] G11B *5/012*

U.S. Cl. 360—99.06 **4 Claims**

1. A recording apparatus for recording information by a recording head on a recording medium in a cassette positioned in said recording apparatus, comprising:

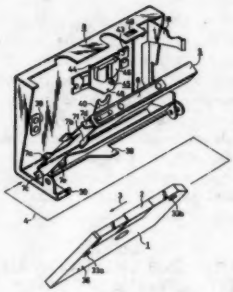
a shaft member provided on a chassis of said recording apparatus;

a cover held pivotally on said shaft member so as to be rotatable about said shaft member and to be opened and closed with respect to said chassis, said cover having first pressing spring means and cassette-positioning means on a surface thereof facing said chassis;

a cassette receiving compartment held pivotally on said shaft member so as to be coaxial with said cover and rotatable, said compartment being positioned between said cover and said chassis and having an opening for insertion and discharge of said cassette, the insertion and discharge directions being parallel to the axis of said shaft member, said compartment being loosely engaged with said cover so as to be movable in accordance with the opening movement of said cover;

second spring means biasing said compartment so as to separate the same from said cover by a predetermined degree which is determined by a loosely engaged relation between said compartment and said cover, whereby said compartment is kept obliquely between said cover and said chassis and allows the insertion of said cassette from said opening into said compartment with said cover being opened;

a slide member held slidably on said chassis and coupled through third spring means to said chassis, said slide member engagable with said cassette and slidable in directions parallel to the axis of said shaft member in response to said cassette being inserted from said opening into said compartment with said compartment being kept obliquely therebetween; and



stopper means engagable with said slide member at termination of the insertion of said cassette so as to hold said cassette at a termination position and disengagable therewith when said cover is opened so that said cassette is discharged from said compartment;

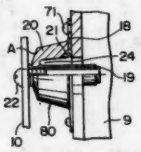
wherein, in response to the insertion of said cassette, said slide member slides against a biasing force of said third spring means produced by the insertion of said cassette and is held by said stopper means at the termination position, and wherein when said cover is closed after the termination of the insertion of said cassette, said first pressing spring means presses and said cassette-positioning means positions said cassette at a predetermined position on said chassis; and whereby after termination of a recording, said slide member is released from said stopper member in response to the opening of said cover and discharges said cassette from said compartment by means of the biasing force of said third spring means with said compartment being kept obliquely with respect to said chassis.

4,812,932

VIBRATION PROOF SUPPORTING STRUCTURE FOR DISK-TYPE INFORMATION MEMORY UNIT

Toshio Hishinuma, Kanagawa; Atsushi Katsuta, and Takeharu Tajima, both of Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 8, 1987, Ser. No. 70,935
Claims priority, application Japan, Jul. 9, 1986, 61-159607
Int. Cl.[4] G11B 5/012, 23/02
U.S. Cl. 360—97.01 10 Claims



1. In a file memory unit having a casing for accommodating a disk-shaped recording medium and a head positioning mechanism for positioning a read-write head along a path to an intended position on said recording medium and thereby producing head vibration, and a frame for supporting said casing through a vibration and impact absorbing means, wherein said casing accommodates a rotational drive mechanism for rotating said disk-shaped recording medium and the head positioning mechanism which produces the drive force for moving said readwrite head along the path to the intended position on said recording medium, and wherein said vibration and impact absorbing means is intended to absorb the vibration along the path that is attributable to the drive force of said head positioning mechanism within said casing and the vibration along the path that is applied to said frame from the outside of the file memory unit, wherein the improvement comprises:

said vibration and impact absorbing means having a first spring constant along said path that is small enough to allow the movement of the head vibration for a small first displacement along the path, of said casing relative to said frame without encountering a substantial

said vibration and impact absorbing means having a second spring constant along said path that is greater than said first spring constant for absorbing the vibration between said casing and said frame applied along said path to said frame from the outside of said frame for a second displacement along the path of said casing relative to said frame, with said second displacement occurring serially after said first displacement;

and said vibration and impact absorbing means having a third spring constant along said path that is greater than said second spring constant for absorbing a large impact applied to said frame from the outside of said frame that produces a third displacement along the path of movement of said casing relative to said frame, with said third displacement occurring serially after said second displacement.

4,812,933

MAGNETIC DISC RECORDING AND REPRODUCING DEVICE

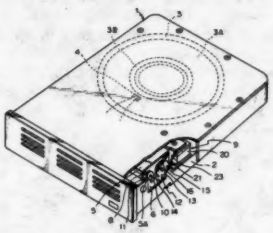
Shuichi Nakamura, Tokyo, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Nov. 18, 1987, Ser. No. 124,956
Claims priority, application Japan, Nov. 20, 1986, 61-178419[U]
Int. Cl.[4] G11B 5/54, 21/22
U.S. Cl. 360—105 1 Claim

1. A magnetic disc recording and reproducing device of the type having a magnetic head adapted to be floated above the disc surface of a magnetic disc in response to the rotation of the magnetic disc and to be displaced in the direction of the radius of the magnetic disc by a drive motor, said device comprising a magnetic head automatic returning means including:

a pinion fixedly mounted on a drive shaft of said drive motor for rotation through a predetermined angle in correspondence to the reciprocation of said magnetic head;

a magnetic head returning member rotatably disposed and adapted to assume a condition of disengagement from the pinion at the end of "return to zero" motion of the drive motor and to assume a condition of engagement with said pinion when the drive motor is stopped so as to forcibly rotate said pinion, thereby returning said magnetic head to a predetermined position;



a biasing spring for biasing said magnetic head returning member in the direction of tending to engage with said pinion; and

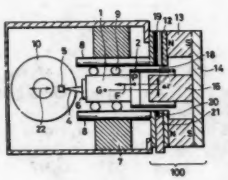
a lock mechanism for holding said magnetic head returning member in the condition of being disengaged from said pinion against the spring force of said biasing spring at and after the end of the "return to zero" motion of said drive motor and for permitting said magnetic head returning member to rotate by virtue of the force of said spring when the drive motor is stopped.

4,812,934

ACTUATOR FOR MEMORY STORAGE DEVICE

Masami Suzuki, Odawara; Hirushi Nishida, Nakagun; Tomio Suzuki, Hiratuka; Katsumi Kawamura, and Tsuyoshi Takahashi, both of Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 18, 1987, Ser. No. 63,510
Claims priority, application Japan, Jul. 2, 1986, 61-154020
Int. Cl.[4] G11B 5/55, 21/08
U.S. Cl. 360—106 9 Claims



1. An actuator for memory devices, which is adapted to move a magnetic head above a recording medium, comprising : an actuator assembly supporting said magnetic head to guide the same so that said magnetic head can be moved reciprocatingly along a fixed path;

driving means for applying a driving force to said actuator assembly;

said actuator assembly having guide rails along which said magnetic head is guided linearly;

said driving means having a magnetic circuit including a first magnet and forming a magnetic gap;

a coil combined with said actuator assembly and inserted

into said magnetic gap in said magnetic circuit so that an electric current being applied to said coil will move said actuator assembly linearly and reciprocatingly; and

regulating structure in said driving means to regulate the position at which the driving force applied to said actuator assembly works, by varying the distribution of the magnetic flux density of a magnetic field applied from said magnetic circuit to said coil, thereby aligning the center of gravity of the actuator assembly with the center of the driving force of the driving means.

4,812,935

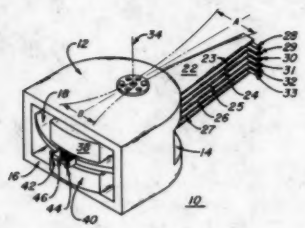
APPARATUS FOR DAMPING HEAD POSITIONERS FOR DISC DRIVES

Roger R. Sleger, Meridian, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 788,282, Oct. 16, 1985, abandoned. This application Oct. 26, 1987, Ser. No. 114,253

Int. Cl.[4] G11B *5/55*

U.S. Cl. 360—106 **1 Claim**



1. In a head positioner apparatus for a magnetic disc drive wherein one or more track accessing arms are rotatably mounted on a chosen axis and have a point of maximum vibrational resonance amplitude at a certain distance from said chosen axis, the improvement comprising: a damper housing having interior walls receiving a viscous film and including a mass located on said viscous film, with said viscous film located between said interior walls and said mass for enabling movement of said mass on said viscous film regardless of the orientation of said head positioner apparatus with respect to gravity, said damper housing mounted on said track accessing arms a predetermined distance from said chosen axis and at a location for receiving a significant vibrational resonance amplitude from said track accessing arms.

4,812,936

CASSETTE HAVING MAGNETIC TAPE PROTECTED FROM CONTAMINANTS

Takateru Satoh, and Haruo Shiba, both of Nagano, Japan, assignors to TDK Corporation, Japan

Filed Dec. 6, 1985, Ser. No. 806,095

Claims priority, application Japan, Dec. 7, 1984, 59-185895

Int. Cl.[4] G11B *23/087*

U.S. Cl. 360—132 **17 Claims**

1. A magnetic tape cassette, comprising:

(a) a housing having wall portions bounding an interior and an open front side;

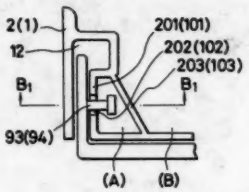
(b) means for mounting magnetic tape in the interior of the housing for travel in a taut state past the front side of the housing during use of the cassette;

(c) a protective cover for protecting the taut magnetic tape at the front side of the housing;

(d) cover mounting means for mounting the protective cover on the housing for movement between exposed and protected positions in which the cover respectively exposes and overlies the front side of the housing, said cover mounting means extending into the interior of the housing and providing a passage along which contaminants may enter the interior of the housing; and

(e) blocking means in the interior of the housing for preventing contaminants from the passage from reaching the magnetic tape mounted in the interior of the housing;

wherein the blocking means constitute a pair of partitions,



each connected to the wall portions of the housing, and sub-dividing the interior of the housing into a tape-receiving compartment in which the tape is received, and a contaminant-receiving compartment in which contaminants are received, each partition preventing communication between the tape-receiving compartment and a respective contaminant-receiving compartment.

4,812,937

MAGNETIC DISK CARTRIDGE WITH IMPROVED CENTER PLATE FOR DISK MOUNTING

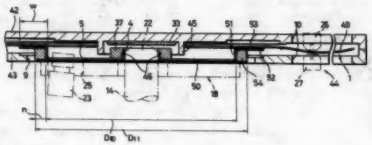
Tsuneo Nemoto, and Mika Kaneko, both of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 909,469, Sep. 19, 1986, abandoned. This application Jun. 23, 1988, Ser. No. 212,025

Claims priority, application Japan, Sep. 25, 1985, 60-211976

Int. Cl.[4] G11B *23/03*

U.S. Cl. 360—133 **2 Claims**



1. In a disk cartridge comprising a sheet-like, flexible recording medium fixed to the periphery of a circular center plate in which a substantially square center hole and a substantially rectangular eccentric driving hole are provided, and a cartridge rotatably accommodating the sheet-like, flexible recording medium and including an upper half and a lower half having a turntable insertion hole in which said circular center plate is loosely fitted; the improvement comprising a synthetic resin ring formed integrally and coaxially with said circular center plate on the upper side thereof and having a small diameter relative to said center plate so as to surround said substantially square center hole, said substantially square center hole of the circular center plate having an upstanding flange extending along the edge thereof and being formed with gaps into which said synthetic resin ring is molded so as to securely attach said synthetic resin ring to said circular center plate, said circular center plate further having a cylindrical portion proximate said periphery thereof, a stabilizing ring affixed to an outer surface of said cylindrical portion out of contact with said recording medium for providing rotational stability to said circular center plate, and a locating rib substantially concentric with said synthetic resin ring on said center plate and formed integrally with said upper half of the cartridge on the inside thereof and having a small diameter relative to said center plate and larger than the diameter of said synthetic resin ring so as to

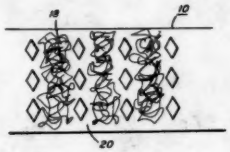
be located between said driving hole and said square center hole and having a height so as to depend around said synthetic resin ring for positioning said recording medium in said cartridge.

4,812,938

FLOPPY DISK LINER WITH IMPROVED CLEANING ABILITY

Randall J. Rogers, 300 Orchard St., Millis, Mass. 02052; Beth Z. Silverman, 296 Homer St., Newton, Mass. 02159, and Armand F. Lewis, 15 Ocean View Ave., Mattapoisett, Mass. 02739

Filed Jun. 18, 1987, Ser. No. 64,415
Int. Cl.[4] G11B *23/03*; B65D *25/30*
U.S. Cl. 360—133 **36 Claims**



1. An improved linear material for wiping debris from a recording media to eliminate errors in transmission of information with respect to said recording media, said linear being a cohesive nonwoven web having fibrous surfaces and void volumes therewithin, the improvement comprising:

at least one surface of said linear contactable with a surface of the recording media, said liner surface having a fretting area of free vibratable fibers comprising at least 10% of said surface, said free vibratable fibers, when vibrated against the surface of said recording media and in contact with said debris, imparting energy thereto causing said debris to move into said void volume of said linear removing said debris from the recording media,

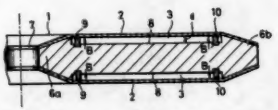
wherein the free vibratable fibers within said fretting area are fibers having a crimped structure of a selected number of crimps formed along the length of the fibers for improving the debris-removing property of said fibers.

4,812,939

MAGNETIC RECORDING DISC HAVING TENSIONED AND ELASTICALLY-SUPPORTED RECORDING SURFACE

Kengo Oishi, Kanagawa, Japan, assignor to Fuji Photo Film Company, Kanagawa, Japan

Filed Jul. 28, 1986, Ser. No. 889,716
Claims priority, application Japan, Aug. 3, 1985, 60-119604[U]
Int. Cl.[4] G11B *5/82*
U.S. Cl. 360—135 **9 Claims**



1. A recording disc, comprising:

a substrate having on at least one principle surface an annular recess formed between inner and outer annular rings;

at least one annular elastic member disposed between said inner and outer annular rings of said annular recess, said at least one annular elastic member being disposed adjacent a wall formed by one of said inner and outer annular rings and said recess and having a height which is greater than a height of said wall; and

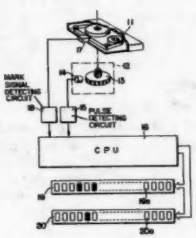
a flexible recording sheet on said at least one principal surface, said flexible recording sheet covering and compressively contacting said at least one annular elastic member and being bonded to said substrate in a vicinity of both said inner and outer annular rings such that said bonded flexible recording sheet is elastically supported and kept under tension by said annular elastic member, wherein a gap is formed between said flexible sheet and a bottom surface of said recess.

4,812,940

DICTATION DISPLAY FOR DISPLAYING PRESENT POSITION AND CUE MARK POSITION INFORMATION

Hideo Takenaga, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Jun. 16, 1987, Ser. No. 62,868
Claims priority, application Japan, Jun. 20, 1986, 61-144241; Jun. 20, 1986, 61-144242; Jun. 20, 1986, 61-144243
Int. Cl.[4] G11B *15/18, 19/02, 27/12*
U.S. Cl. 360—137 **13 Claims**



1. A display apparatus for a recording and/or playback device, comprising:

pulse generator means for generating pulses in response to the rotation of a reel to which one end of a recording tape is fixed;

mark signal detector means for detecting a plurality of mark signals recorded on said recording tape;

a plurality of counter means corresponding respectively to said plurality of mark signals, each of said counter means for counting said pulses for a length of time determined by the positions of its respective mark signal;

display row means in which a plurality of display elements are arranged in at least one row, each of said display elements indicating a predetermined time interval;

means for displaying on said display row means the present position of said tape as the tape is moved past a tape head;

converter means for converting counts stored in said counter means to time intervals, said conversion being carried out each time a new mark signal is detected as a function of the relative position of the most recently and previously detected mark signals; and

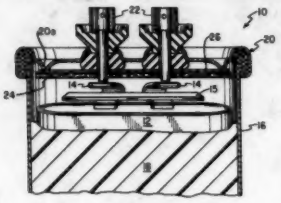
means for displaying on said display row means the position of said mark signals recorded on said tape as a function of said converted time intervals.

4,812,941

CAPACITOR AND METHOD OF MANUFACTURE

Ronald B. Rice, Monroe; Edward M. Lobo, Shelton; Hector A. Casanova, Bridgeport, and Theodore P. Kosnosky, West Haven, all of Conn., assignors to Magnetec Corporation, Los Angeles, Calif.

Filed Aug. 19, 1987, Ser. No. 87,019
Int. Cl.[4] H01G *1/10*
U.S. Cl. 361—15 **18 Claims**



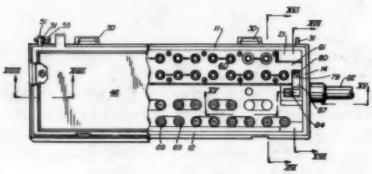
1. A capacitor assembly comprising;
a metal housing;
a zinc alloy metallized dielectric sheet material wound into a roll-shape and disposed within said housing;
a potting compound provided within said housing so as to encapsulate said metallized sheet material, said potting compound being a blend of asphalt and wax additive;
means for providing an electrical connection between said sheet material and the exterior of said housing; and
means within said housing for interrupting said electrical connection upon the occurrence of an excessive pressure within said housing.

4,812,942

AERIAL CABLE TERMINAL

Albert Kupferschmidt, Highland Park; Trace D. Greene, Glenview, and Donald F. Jaycox, Deerfield, all of Ill., assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 28, 1987, Ser. No. 43,401
Int. Cl.[4] H01R *9/00*; H02G *15/10*
U.S. Cl. 361—119 **19 Claims**



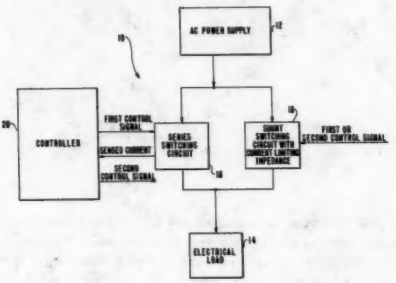
1. An aerial cable terminal comprising:
an elongate hollow housing having parallel side walls and parallel end walls extending between the side walls, and a central wall extending between the side walls to divide the housing into two chambers, a front chamber and a back chamber;
a plurality of pairs of apertures in the central wall, the pairs extending in rows between the end walls, one aperture of each pair on one side of a central axis and the other aperture of each pair on the other side of the central axis;
a terminal mounted in each aperture, each terminal having a front end extending into said front chamber and a rear end extending into said back chamber, the terminals in a pair of apertures forming a pair of terminals;
conductor means extending between the rear ends of each terminal of a pair;
access means in one end for entry of a stub cable into said back chamber;
an openable cover closing said front chamber; and
support means on a side wall and on each end wall, whereby the terminal housing can be mounted alternatively on a cable or on a pole.

4,812,943

CURRENT FAULT PROTECTION SYSTEM

Gregory D. Jones; William R. Owens, both of Rockford; Clifford G. Thiel, Stillman Valley, and Clive M. Danby, Rockford, all of Ill., assignors to Sundstrand Corp., Rockford, Ill.

Filed Dec. 24, 1987, Ser. No. 137,583
Int. Cl.[4] H02H *3/08*
U.S. Cl. 361—92 **18 Claims**



1. A protection system for a power supply for preventing the drawing of an excessive amount of current by an electrical load fault comprising:
(a) means for sensing the magnitude of current flowing to the electrical load and producing a first control signal having a first level when current flow is less than a maximum amount of the power supply and having a second level when current flow exceeds the maximum amount; and a second control signal having a first level which occurs in response to detection of current flow greater than the maximum amount of current flow and a second level when a load fault is not present;
(b) a switching means disposed in series with the load, conduction of the switching means being controlled by the first control signal and passing current when the first control signal is at the first level; and
(c) a shunt circuit, coupled in parallel with the switching means, the shunt circuit containing a switching circuit coupled to an impedance which limits the amount of current drawn by the load when the impedance is in series with the load, conduction of the switching circuit being controlled by the second control signal and passing current to permit current flow through the impedance of the shunt circuit when the second control signal has the first level and blocking current flow when the second control signal has the second level.

4,812,944

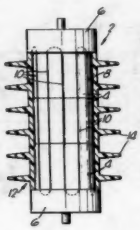
ELECTRICAL EQUIPMENT

Koch U. Eberhard, Ottobrunn, and Boettcher Bodo, Zorneding, both of Fed. Rep. of Germany, assignors to Raychem GmbH, Ottobrunn, Fed. Rep. of Germany

Filed Nov. 5, 1986, Ser. No. 927,634
Claims priority, application United Kingdom, Nov. 8, 1985, 8527548
Int. Cl.[4] H02H *1/04*
U.S. Cl. 361—127 **12 Claims**

1. An elongated surge arrestor comprising at least one surge arresting element mounted between two electrode members, so

as to extend in a longitudinal direction, and a plurality of elongated recoverable polymeric compression members, in which said compression members extend in said longitudinal direction from one of said electrode members to the other of said electrode members and lie around said at least one surge arresting element and said two electrode members at circumferentially spaced-apart locations in non-overlapping relationship with each other, and in which the recovery of said recoverable polymeric compression members is arranged to exert a compressive force in said longitudinal direction on said electrode members so as to urge said electrode members towards said at least one surge arresting element.



4,812,945

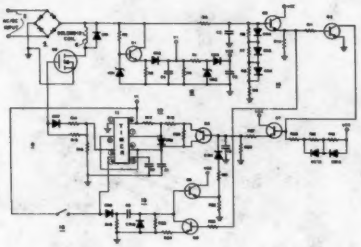
METHOD AND APPARATUS FOR PROVIDING AUTORANGING FOR AN AC/DC POWER MANAGEMENT CIRCUIT FOR DC SOLENOID ACTUATORS

Anthony D'Onofrio, West Hartford, Conn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 4, 1987, Ser. No. 45,644

Int. Cl.[4] H01H *47/32, 47/12, 9/00, 51/30*

U.S. Cl. 361—154 **17 Claims**



1. A power control circuit comprising

timer means for selectively providing a sequence of DC current pulses at a frequency dependent on a control signal applied thereto,

circuit means for applying the pulses to a DC operated electromagnetic solenoid,

power supply means responsive to an input voltage for supplying DC power to said timer means and

compensating means for controlling said timer means by the control signal to reduce the frequency of the pulses applied to the solenoid after an initial first frequency during a first time period for producing a first number of pulse applications during the first time period by changing the off time between the pulses to produce the reduced frequency and a consequent reduced number of pulses during a second time period following the first period in direct proportion to the magnitude of the input voltage to maintain a predetermined average current in said solenoid during the second time period of the reduced number of pulses.

4,812,946

DEMAGNETIZATION AND EARTHING DEVICE FOR A PICTURE TUBE AND MACHINE FOR MANUFACTURING SAME

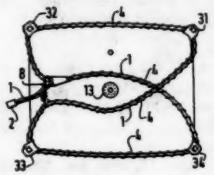
Georges Prigent, Versailles; Patrick Besnard, and Jacques Dupaillon, both of Berd'Huis, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 8, 1987, Ser. No. 107,073

Claims priority, application France, Oct. 10, 1986, 86 14125

Int. Cl.[4] H01F *13/00;* H01H *47/00*

U.S. Cl. 361—150 **5 Claims**



1. A device for demagnetization of a picture tube of a television receiver and for earthing a conductive coating applied to the cone of the tube comprising a demagnetization coil system constituted by a bundle of insulated electric wires held together and forming at least one loop applied to the cone of the tube as well as an electrical conductor connected to earth and arranged so as to be in electrical contact with the coating, characterized in that the conductor encloses the demagnetization coiled bundle.

4,812,947

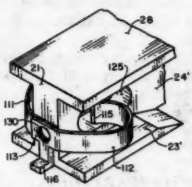
DEVICE FOR DISCHARGING ELECTROSTATIC POTENTIALS

Thomas D. Belanger, Jr., Clarendon Hills, and Roy L. Johnson, Arlington Heights, both of Ill., assignors to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Dec. 17, 1987, Ser. No. 134,482

Int. Cl.[4] H05H *3/00*

U.S. Cl. 361—220 **6 Claims**



1. An electrostatic discharge device arranged to be used with a substrate mounting device, said substrate mounting device including a cut-out area, said electrostatic device comprising:

a center section having an electrically conductive surface, said center section including means for mounting said center section to a substrate mounting device, and means for electrically connecting said center section to a protection ground;

a first semicircular band extending from said center section, said first band terminating at an end portion accommodated in said cut-out area, said first band electrically connected to said center section;

a second semicircular band extending from said center section directly opposite said first band, said second band terminating at an end portion accommodated in said cut-out area, and said second band electrically connected to said center section; and

responsive to the installation of a circuit substrate to said substrate mounting device, said first band contacts an edge of said circuit substrate allowing said first band to electrically electrically connect to said circuit substrate thereby, providing an electrical path for discharging electrostatic potentials from said circuit substrate to said protection ground and alternatively, responsive to the installation of a circuit substrate to said substrate mounting device, said second band contacts an edge of said circuit substrate allowing said second band to electrically connect to said circuit substrate thereby, providing an electrical path for discharging electrostatic potentials from said circuit substrate to said protection ground.

4,812,948

SHOE GROUNDING STRAP

Gerald C. Bird, and Orville M. Wiste, both of Round Rock, Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 15, 1988, Ser. No. 168,375
Int. Cl.[4] H05F *3/02*
U.S. Cl. 361—223 **18 Claims**

1. A shoe strap for use in dissipating static electricity from the body of a person to a conductive surface and for protecting the person from electrical hazards, said strap comprising:

an elongate band having two sides and two narrow edges, said band comprising a ribbon of conductive material and static dissipative polymeric material coated on said ribbon and disposed on at least one side and said narrow edges of said band; and

pressure sensitive adhesive means coated on said other side of said band for adhering said strap to a shoe and for exposing only said static dissipative material when said strap is adhered to a said shoe.

4,812,949

METHOD OF AND APPARATUS FOR MOUNTING AN IC CHIP

Jacques Fontan, Sonchamp; Karel Kurzweil, Saint Nom La Breteche, and Gérard Dehaine, Chatillon, all of France, assignors to Bull, S.A., Paris, France

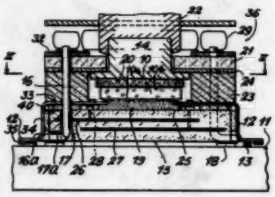
Filed Mar. 24, 1987, Ser. No. 29,546
Claims priority, application France, Mar. 28, 1986, 86 04500
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—386 **43 Claims**

19. A package (36,36') for an integrated circuit chip (10) having an active face (10*a*) and a back face (10*b*) comprising:

(a) a tape automated bonding pattern of electrical leads (12) for connection to the active face of the chip;

(b) a heat sink base (14) for connection to the back face of the chip;

(c) a rigid board (15) disposed facing the active face (10*a*) of the chip (10) said board supporting a portion of the pattern of leads and said board having at least two conductive planes (26,27) and a plurality of conductive areas respectively connected to one of the conductive planes and arranged to be in contact with a respective plurality of said leads in the vicinity of the chip; and



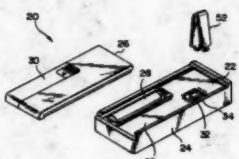
(d) conductor elements (16) fixed perpendicular to the board, each having an outer end for application of an external supply potential and being electrically connected to at least one of the conductive planes.

4,812,950

MEANS FOR MOUNTING A ROM ON A PRINTED CIRCUIT BOARD

Takashi Oyamada, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed May 14, 1987, Ser. No. 50,058
Claims priority, application Japan, May 16, 1986, 61-73711[U]
Int. Cl.[4] H05K *5/02*
U.S. Cl. 361—395 **8 Claims**



1. A mount for mounting a ROM which may have to be changed from time-to-time, said mount comprising:

a box-like casing having an open side which is closed by a cover member;

a carrier member having a printed circuit on one surface and an aperture extending from said one surface to the opposite surface, said carrier member being mounted on said casing with said printed circuit facing the outside of said casing and said aperture facing the cover so that electronic parts mounted on said carrier member and interconnected by said printed circuit are inside said casing; and

ROM mounting means mounting on said carrier member in the area of said aperture for receiving a ROM through said aperture, said ROM mounting means having electrical connecting means which electrically connects leads of a ROM to said printed circuit on said one surface, whereby a ROM may be changed from the side of said cover.

4,812,951
ELECTROLYTIC CAPACITOR AND ELECTROLYTE THEREFOR
Brian Melody, Greencastle, and James A. Clouse, Lebanon, both of Ind., assignors to Aerovox M, Inc., Glaskow, Ky.
Filed Mar. 20, 1987, Ser. No. 28,221
Int. Cl.[4] H01G 9/00, 5/22
U.S. Cl. 361—504 10 Claims

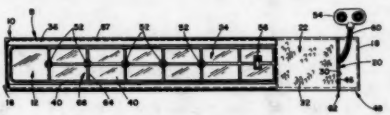
8. An electrolyte capacitor comprising a pair of electrodes, at least one of which is composed of film-forming metal and an electrolyte containing no more than about 30 volume % dimethyl sulfoxide and about 65 to about 80 volume % N-ethyl-2-pyrrolidone.

4,812,952
SELF-ILLUMINATING FLORAL DEVICE
Gregory Clemens, 501-A E. Second St., Berwick, Pa. 18603
Filed Mar. 25, 1987, Ser. No. 29,784
Int. Cl.[4] F21V 9/16
U.S. Cl. 362—84 2 Claims

1. In a floral arrangement, a stick-in decoration in combination with the floral arrangement comprising:
(a) a decorative portion,
(b) a flexible, hollow, shaft portion connected on one end of the decorative portion,
(c) a chemiluminescent light stick positioned within the shaft portion.

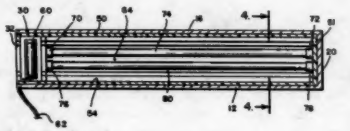
4,812,953
SAFETY LIGHT BAND
Willy G. Ask, Ulricehamn, and E. Peter M. Wahlberg, Boras, both of Sweden, assignors to Newline Electronic AB, Ulricehamn, Sweden
Filed Mar. 7, 1988, Ser. No. 165,172
Int. Cl.[4] F21L 15/08
U.S. Cl. 362—103 1 Claim

1. A safety light band for increasing the visibility of a person wearing the band comprising:
a strap adapted to wrap a limb of said person and being formed in a structure of layered components comprising front and rear strap layers defining front and rear planar sides of said strap;
a pouch formed within said strap between said front and rear sides, said pouch being adapted to house a battery;
luminous means including a reflective surface at said front of said strap, a plurality of electric lamps, a battery connector, electric lines extending between said lamps and said battery connector, said battery connector being receivable in said pouch in an operative band-wearing position with said electric lines contained within said strap between said front and rear sides, said lamps being disposed between said front and rear sides of said strap with said lamps



protruding through said front layer to be visible at said front side and,
said front strap layer being comprised of layered components including a first plastic layer bearing said reflective surface and a transparent second plastic layer overlying said first plastic layer, said reflective surface being disposed in a pattern of areas having relatively contrasting reflectivity, and said first and second plastic layers being adhered with a watertight seal delineating said areas and forming corresponding watertight pockets between said plastic layers.

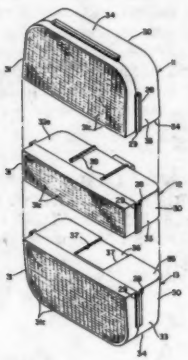
4,812,954
APPARATUS FOR BACK LIGHTING MARBLE FOR DECORATIVE FURNITURE ITEMS
Joseph S. Marton, 608-1/2 N. Sycamore, Los Angeles, Calif. 90036
Filed May 16, 1988, Ser. No. 194,097
Int. Cl.[4] H47B 97/00
U.S. Cl. 362—134 10 Claims



1. A tower comprising:
a. four generally perpendicular generally rectangular shaped outer surface walls and a top adjoining the four walls to thereby form a hollow tower;
b. each of said four outer surface walls being made of thin light colored marble;
c. an interior housing member located within said tower and made of four generally perpendicular generally rectangular shaped transparent walls which removably press fit within the tower structure such that a respective one wall of the interior housing member lies adjacent the rear surface of a respective outer surface wall of the tower;
d. said interior housing member further comprising a source of illumination including at least one fluorescent source of light and electronic means for activating and maintaining the illumination from the light; and
e. said interior housing member further comprising an opening means located in one of its walls to permit access to the interior of the interior housing member;
f. whereby when said source of illumination is activated, the fluorescent light causes light to shine through the transparent walls of the interior housing member and onto the rear surface of each of the outer surface wall to illuminate

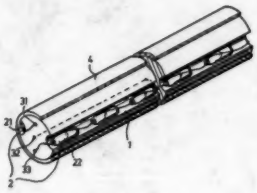
the marble and cause the veins in the marble to become enhanced and stand out from the remainder of the marble.

4,812,955
MODULAR SHOCK RESISTANT/SEALED MULTI-FUNCTION LAMP
John H. Beswick, Jamestown, and Bradley C. VanRiper, Kennedy, both of N.Y., assignors to Truck-Lite Co., Inc., Falconer, N.Y.
Filed Apr. 12, 1988, Ser. No. 180,562
Int. Cl.[4] F21V *1/00*
U.S. Cl. 362—240 20 Claims



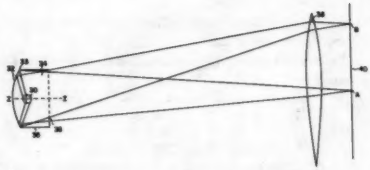
1. A modular multi-function lamp assembly of plural shock mount lamps for automotive vehicles, such as trucks, trailers and the like, made up of interchangeable lamp modules, comprising a generally cup-shaped assembly housing having a back wall and adjoining side walls defining an outwardly opening cavity for receiving a plurality of individual lamp modules in a vertical stacked array aligned with each other, and nested within the cavity, each module comprising a module case member having sides and a lens member hermetically sealed at the periphery of the lens member to the sides of the case member defining a sealed enclosure, a lamp bulb and shock mount therefore in each such enclosure, the case member of each module including at least one side forming a flat planiform abutment wall to be disposed in a horizontal transverse position within said cavity to be disposed in confronting abutment with a paired companion like abutment wall of an adjacent one of said modules, said abutment walls which are in paired companion relationship having interlocking formations to restrain them in assembled together abutting relationship, and said modules having outwardly protruding rib formations along exterior surfaces of opposite sides thereof adjoining said abutment walls thereof, and side walls of said assembly housing confronting said opposite sides of said modules having recessed channel means and being flexibly deformable sufficient to be flexed to accommodate insertion movement of said modules inwardly of the housing to positions interposing said rib formations into said channel means for holding the modules in said housing.

4,812,956
FLEXIBLE LAMP-STRING DEVICE
Scott Chen, Taipei, Taiwan, assignor to Tien Teng Wang, Hsin Chuang, Taiwan
Continuation-in-part of Ser. No. 23,933, Mar. 5, 1987, abandoned, which is a continuation of Ser. No. 826,999, Feb. 7, 1986, abandoned. This application Sep. 17, 1987, Ser. No. 97,722
Int. Cl.[4] F21V *21/14*
U.S. Cl. 362—249 8 Claims



1. A flexible lamp-string device, comprising:
a mounting band made of transparent and pliable plastic material, and having an outer peripheral surface and at least one groove extending radially inwardly and axially along the mounting band;
at least one lamp-string set, each set comprising a plurality of lamp-strings installed in a respective groove of said mounting band;
conducting wires molded axially in said mounting band, one end of each of said lamp-strings being connected to a common wire of said conducting wires and another end of each said lamp-strings being connected to one of the other conducting wires; and
a PVC tube having an inner surface and covering said mounting band, the at least one groove and an adjacent portion of the inner surface of the PVC tube forming an enclosure for receiving a lamp-string set therein, and providing means for water-proofing and shock-proofing said at least one lamp-string set.

4,812,957
OPTICAL SYSTEM FOR UNIFORM ILLUMINATION OF A PLANE SURFACE
James D. Hill, Mount Airy, Md., assignor to Fusion Systems Corporation, Rockville, Md.
Filed Jul. 23, 1985, Ser. No. 757,976
Int. Cl.[4] F21V *7/00*; H01J *17/20*
U.S. Cl. 362—263 12 Claims



1. An optical system for imaging a non-uniform light source onto an image plane to provide uniform illumination on said image plane, comprising:
a focusing reflector for reflecting light rays; and
a source of light disposed on the optical axis of the reflector and on or near the focal point of the reflector, said source comprising an enclosed body of luminous gas, the horizon of which appears, relative to the center, brighter near the poles and dimmer near the equator, or brighter near the equator and dimmer near the poles when viewed from a

position near the equatorial plane, wherein said poles are points of the source which are on the optical axis of the focusing reflector, the equator represents points on the surface of said source in a plane through the geometrical center of the source and normal to said axis of said focusing reflector, and the horizon is a perimeter of the source viewed from any point outside the source;

wherein said light source is a bulb wherein said luminous gas is generated by a plasma forming medium and said focusing reflector forms a portion of a microwave cavity in which said bulb is located,

and further including a collimating lens disposed between the image plane and the light source at a distance from the light source so that the limiting aperture of the reflector is at or near the focal point of said lens, whereby light emanating from said source provides uniform and telecentric illumination on said image plane.

4,812,958

ELECTRICAL SERVICES POLE

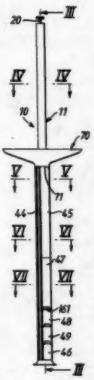
John A. Rolfe, Surrey; Arthur W. Dalton, London, and Robert Silvester, Surrey, all of England, assignors to Rolfe & King Limited of the Lansbury Estate, Surrey, England

Filed Dec. 17, 1986, Ser. No. 942,913

Claims priority, application United Kingdom, Dec. 17, 1985, 8531023

Int. Cl.[4] F21S *1/00*

U.S. Cl. 362—431 **11 Claims**



1. An electrical services pole which is height adjustable for clamping between the floor and the ceiling of a room, comprising:

an upper generally tubular core section;

a lower generally tubular core section slidingly receiving said upper tubular section through an upper end and forming therewith vertical conduit means for cables;

means for controllably and positively affixing said upper and lower tubular core sections with respect to each other to obtain a selected overall affixed length thereof; and

a lighting bowl carrying a light source and a light reflector, mounted fixedly on and supported by the lower core section at said upper end thereof, the upper core section extending through the lighting bowl.

4. An electrical services pole which is height adjustable for clamping between the floor and the ceiling of a room, comprising:

an upper generally tubular core section vertically overlapping a lower generally tubular core section and forming therewith vertical conduit means for cables;

cladding mounted on the lower tubular core section to form a sleeve extending therearound and defining therewith means for forming at least one vertically extending compartment to contain electrical cables; and

a plurality of socket outlets mounted on the lower core section facing outwardly thereof, said outlets being spaced inwardly from said cladding and said cladding being provided with means for defining an access opening therein, said opening being closable by panel means for providing protected access to said outlets.

4,812,959

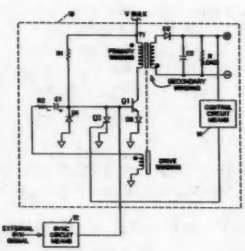
SYNCHRONIZATION CIRCUIT FOR A BLOCKING OSCILLATOR

Carleton D. Driscoll; Elie M. Najm, both of Cary, and Manfred Waechter, Raleigh, all of N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed May 20, 1987, Ser. No. 52,673

Int. Cl.[4] H02M *3/335*

U.S. Cl. 363—20 **8 Claims**



1. In a display system having an improved power subsystem and a display subsystem with said power subsystem comprising:

(a) a blocking oscillator power supply including a power transformer having primary and secondary winding for providing current to the display subsystem, a first switching transistor connected to one end of the primary winding of said power transformer, and a first control circuit for coupling the secondary winding to the switching transistor with said first control circuit controlling the on period of said switching transistor;

(b) first circuit means for generating synchronizing pulses representative of a frequency at which said blocking oscillator power supply is being synchronized;

(c) second circuit means connected to the switching transistor and the first circuit means and operable upon activation by said synchronizing pulses to extend the OFF period of said switching transistor to cause said power supply to operate in a fully reset fixed frequency flyback mode; and

(d) third circuit means connected to the switching transistor and the first circuit means and operable upon activation by the synchronizing pulses and termination of said OFF period to restart the ON period of said switching transistor.

4,812,960
POWER FEEDING APPARATUS

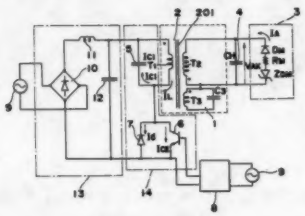
Kazuho Sakamoto, Kyoto; Takao Shitaya; Shigeru Kusunoki, both of Yamatokoriyama; Naoyoshi Maehara, Nara; Takashi Niwa, Nara; Takahiro Matsumoto, Nara, and Daisuke Bessyo, Yamatokoriyama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 11, 1987, Ser. No. 131,717

Claims priority, application Japan, Dec. 15, 1986, 61-298144; Dec. 15, 1986, 61-298145; Dec. 15, 1986, 61-298146

Int. Cl.[4] H02M *3/335*

U.S. Cl. 363—20 **7 Claims**



1. A power feeding apparatus for receiving power from a power source and comprising: at least one semiconductor switch; a power transducer having a driving means for generating a high-frequency power of a preselected frequency; a load consisting of a magnetron which has unidirectional electrical current characteristics; a transformer which feeds said high frequency power from said power transducer to said load, and a tuning circuit means which has a resonant frequency which is the third higher harmonic of said preselected frequency of said power transducer, said tuning circuit means being connected to said power transducer.

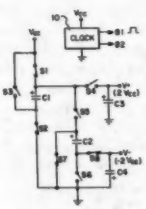
4,812,961
CHARGE PUMP CIRCUITRY HAVING LOW SATURATION VOLTAGE AND CURRENT-LIMITED SWITCH

Robert Essaff, Fremont, and Robert C. Dobkin, San Jose, both of Calif., assignors to Linear Technology, Inc., Milpitas, Calif.

Filed May 15, 1987, Ser. No. 50,896

Int. Cl.[4] H02M *3/18*

U.S. Cl. 363—61 **7 Claims**



1. A charge pump circuit comprising

a supply terminal for connecting to a voltage source, V_{cc},

a ground terminal for connecting to a ground potential,

a first capacitor serially connected with first and second switch means between said supply terminal and said ground terminal,

a third switch means connected in parallel with said first switch means and said first capacitor,

a second capacitor serially connected with fourth and fifth switch means between the common terminal of said first switch means and said first capacitor and said ground terminal,

a third capacitor serially connected with a sixth switch means between said ground potential and the common terminal of said first switch means and said first capacitor, the common terminal of said third capacitor and said sixth switch means connected to a positive voltage ($+2V_{cc}$) terminal,

a fourth capacitor serially connected with a seventh switch means between said ground potential and the common terminal of said second capacitor and said fifth switch means, the common terminal of said fourth capacitor and said seventh switch means connected to a negative voltage ($-2V_{cc}$) terminal, and

an eighth switch means connected in parallel with said second capacitor and said fifth switch means,

whereby closure of said first, second, seventh and eighth switch means during a first operational phase generates a voltage V_{cc} across said first capacitor, and closure of said third, fourth, fifth and sixth switch means during a second operational phase transfers a voltage $+2V_{cc}$ to said second and third capcitors, and during a subsequent first operational phase a voltage $-2V_{cc}$ is transferred to said fourth capacitor.

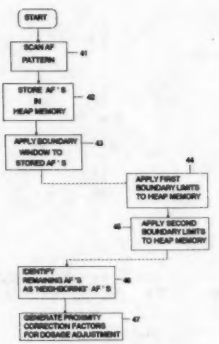
4,812,962
AREA FEATURE SORTING MECHANISM FOR NEIGHBORHOOD-BASED PROXIMITY CORRECTION IN LITHOGRAPHY PROCESSING OF INTEGRATED CIRCUIT PATTERNS

Terence R. Witt, Indian Harbour Beach, Fla., assignor to Harris Corp., Melbourne, Fla.

Filed Apr. 9, 1987, Ser. No. 36,508

Int. Cl.[4] G03C *5/00*

U.S. Cl. 364—490 **11 Claims**



1. For use with proximity correction of dosage in lithography processing of a pattern of area features to form an integrated circuit device, a method of locating those area features which lie within a prescribed proximity correction neighborhood of a respective area feature, comprising the steps of:

(a) for each of a plurality of distance increments extending in a first direction across said pattern, examining said pattern to identify those area features which are located within a respective area window extending in a second direction from a respective distance increment, and generating and storing information representative of characteristics of each identified area feature in a group that is associated with that respective area window;

(b) for each of the area features whose identities have been stored in respective groups in step (a), defining a boundary window which delineates said prescribed proximity cor-

rection neighborhood relative to that respective area feature; and

(c) for a respective area feature, identifying those area features that have been stored in step (a) and characteristics of which are contained within the boundary window for said respective area feature as lying within said prescribed proximity correction neighborhood of said respective area feature.

4,812,963

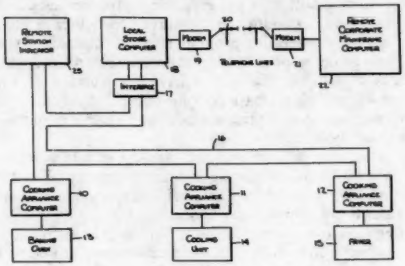
PLURAL COOKING COMPUTER COMMUNICATION SYSTEM

Lance M. Albrecht, Wallingford; Mario Pasquini, Milford, and William M. Schreyer, Monroe, all of Conn., assignors to Food Automation-Service Techniques, Inc., Stratford, Conn.

Filed Mar. 31, 1987, Ser. No. 33,097

Int. Cl.[4] H05B *1/02*

U.S. Cl. 364—131 **12 Claims**



1. A cooking computer communication system comprising:

at least two cooking appliance computer means for setting a desired value of at least one parameter of at least two cooking appliances and for sending messages;

a bi-directional bus coupled to said computer means; and

a control computer means coupled through said bus to said at least two cooking appliance computer means for receiving messages therefrom and for sending messages through said bus for controlling said cooking appliance computer means in setting said desired value;

each of said at least two cooking appliance computer means comprising means for bi-directionally communicating with said control computer means, and comprising means for bi-directionally communicating with another of said at least two cooking appliance computer means, for receiving messages and for sending messages.

4,812,964

SIGNAL TRACING CONTROL SYSTEM FOR PMC

Nobuyuki Kiya, Hachioji; Shuji Toriyama, Kawasaki, and Yoshiharu Saiki, Hachioji, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP87/00224, § 371 Date Nov. 25, 1987, § 102(e) Date Nov. 25, 1987, PCT Pub. No. WO87/06365, PCT Pub. Date Oct. 22, 1987

PCT Filed Apr. 10, 1987, Ser. No. 140,260

Claims priority, application Japan, Apr. 15, 1986, 61-086918

Int. Cl.[4] G06F *11/30*; G11C *29/00*

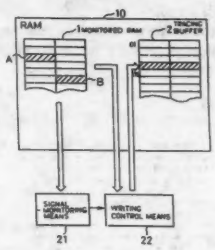
U.S. Cl. 364—140 **6 Claims**

1. A signal tracing control system in a programmable machine controller (PMC) for controlling a machine in response to a signal from a numerical control apparatus, comprising:

a random access memory (RAM);

monitoring means, coupled to said RAM, for monitoring a signal of said RAM for detecting a change;

writing control means, coupled to said RAM and said monitoring means, for writing data to said RAM in response to a signal indicative of a change in a signal from said monitoring means; and



a tracing buffer, coupled to said writing control means, for storing the data of said RAM which is written by said writing control means.

4,812,965

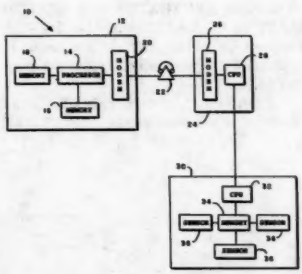
REMOTE POSTAGE METER INSEPCTION SYSTEM

Michael P. Taylor, Norwalk, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Aug. 6, 1985, Ser. No. 762,991

Int. Cl.[4] G06F *15/02*

U.S. Cl. 364—550 **13 Claims**



4. A system for inspecting postage meters remotely, comprising:

a postage meter having a memory therein, means for sensing postage meter tampering, means for storing in said memory acts of tampering and means for directly accessing said memory, whereby said memory will provide an indication of any tampering with said postage meter.

4,812,966

WORD BLOCK SEARCHER FOR WORD PROCESSING EQUIPMENT AND SEARCHING METHOD THEREFOR

Syoji Takagi, Toyoake, and Hiroyoshi Saito, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 15, 1985, Ser. No. 798,796

Claims priority, application Japan, Nov. 16, 1984, 59-242680

Int. Cl.[4] G06F *5/00*, *1/00*

U.S. Cl. 364—200 **28 Claims**

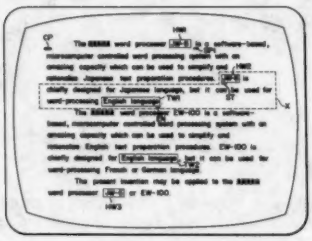
5. A method for searching for a prescribed word block having a head portion at its beginning and a tail portion at its end, said head portion and said tail portion constituting less than the entirety of said word block, said searching being performed within a document that is stored in a memory of word processing equipment, comprising the steps of:

inputting to the word processing equipment a leading word

which serves to define a head portion of a word block desired to be located;

searching the document for a first word corresponding to said leading word;

inputting to the word processing equipment a trailing word which serves to define a tail portion of the word block desired to be located;



searching the document for a second word corresponding to said trailing word; and

displaying a word block that is defined between said first word corresponding to said leading word, and said second word corresponding to said trailing word.

4,812,967

METHOD AND APPARATUS FOR CONTROLLING INTERRUPTS IN A VIRTUAL MACHINE SYSTEM

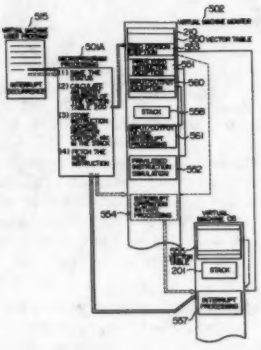
Toshio Hirosawa, Machida; Jun'ichi Kurihara, Hachioji, and Shigemi Okumura, Kiyose, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 7, 1986, Ser. No. 837,345

Claims priority, application Japan, Mar. 11, 1985, 60-46676

Int. Cl.[4] G06F *12/08, 13/00*

U.S. Cl. 364—200 **6 Claims**



1. An interrupt control method in a virtual machine system wherein a plurality of virtual machines are realized by selectively putting into execution, under control of a first control program, one of a plurality of second control programs respectively controlling execution of programs to be executed by said virtual machines, said first control program having a corresponding first vector table for holding physical addresses required to start interrupt processing programs included either in said first control program or in one of said second control programs under execution and said second control programs each having a corresponding second vector table for holding logical addresses indicative of interrupt processing programs included in each second control program, said method comprising the steps of:

(i) generating physical addresses indicative of addresses of interrupt processing programs included in a selected second control program put into execution under control of said first control program, said generation being done based upon said logical addresses held by said second vector table corresponding to said selected second control program;

(ii) writing the generated physical addresses into entries within said first vector table which are predetermined as entries for holding addresses required to start said interrupt processing programs included in said selected second control program;

(iii) starting execution of said selected second control program after the second step (ii);

(iv) reading out one of the addresses held by said first vector table corresponding to an interrupt processing program in response to a generated interrupt request; and

(v) starting said interrupt processing program indicated by said read out address, irrespective of whether or not said interrupt processing program is included in said first control program or said selected second control program.

5. A virtual machine system having a plurality of virtual machines running in a bare machine under control of a control program, said control program including a plurality of instructions, said system comprising:

(i) a memory area of a virtual machine of said plurality of virtual machines existing in a main memory of said bare machine, said memory area being subjected to processing and being continuously allocated;

(ii) means to be operated at an execution of an instruction for adding a first address of the memory area of said virtual machine to a memory address of said bare machine which is generated at the execution of the instruction;

(iii) means to be operated at an occurrence of an interrupt for inhibiting said addition of a first address of the memory area of said virtual machine and a memory address of said bare machine which is generated at the execution of the instruction; and

(iv) means for releasing the inhibiting function performed by said means to be operated at an occurrence of an interrupt before control is returned to execution of an instruction after completion of interrupt processing.

4,812,968

METHOD FOR CONTROLLING PROCESSOR ACCESS TO INPUT/OUTPUT DEVICES

Fred Poole, San Jose, Calif., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Nov. 12, 1986, Ser. No. 929,284

Int. Cl.[4] G06F *13/00, 13/14*

U.S. Cl. 364—200 **9 Claims**

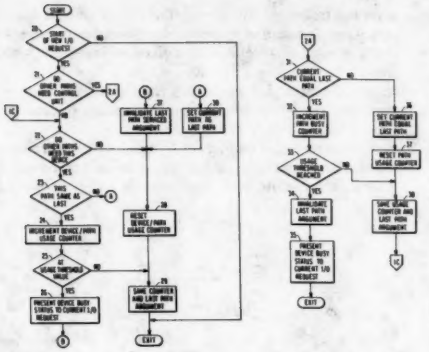
1. A method for controlling processor access to input/output control units, and devices connected to the control units, for each channel input/output request in a shared device multiprocessor system comprising for each new input/output request by a processor the steps of:

testing for contention of a control unit requested by a processor, and if contention exists for the control unit, determining if a predetermined number of accesses have been made by a current processor having access to the control unit;

if a predetermined number of accesses have been made by a current processor having access to the control unit for which there is contention by another processor, signalling the current processor with a busy status to allow access by another processor to the control unit;

testing for contention of a device connected to the control unit, and if there is contention determining if a predetermined number of consecutive input/output operations have been performed by a current processor having access to the device; and

if a predetermined number of consecutive input/output operations have been performed by the current processor



on the device for which there is contention by another processor, signalling the current processor with a busy status to allow access by another processor to the device.

4,812,969

ADDRESS TRANSLATION UNIT

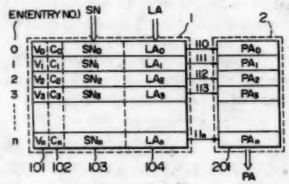
Katsuaki Takagi, Higashimurayama; Hirokazu Aoki, Hachioji; Norio Nakagawa, Kodaira, and Yoshimune Hagiwara, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 22, 1986, Ser. No. 865,840

Claims priority, application Japan, May 24, 1985, 60-110373

Int. Cl.[4] G06F *9/32, 9/36*

U.S. Cl. 364—200 **7 Claims**



6. An address translation unit including an associative look aside buffer (TLB) comprising:

(A) an associative array portion including

(a) a common flag field for storing flag information indicating whether a predetermined logical address corresponds to a common area in a multi-virtual space,

(b) a space number field for storing a space number value,

(c) a logical address field for storing a logical address value,

(d) a coincidence detection line disposed along said space number field and said logical address field,

(e) means for comparing an input space number with a first value stored in said space number field, for comparing an input logical address with a second value stored in said logical address field, for generating a coincidence output on said coincidence detection line when said input space number and said input logical address coincidence with said first and said second values, respectively, and

for generating said coincidence output on said coincidence detection line when said flag information stored said common area flag field indicates that said logical address value stored in said logical address field corresponds to said common area in said multi-virtual space, regardless of said first value stored in said space number field; and

(B) a data portion including

(a) means for selecting one of a plurality of physical addresses in response to outputs on said coincidence detection line of said associative array portion,

wherein said associative array portion further includes

a switching element disposed midway of said coincidence detection line to be turned on and off depending on a value of a memory cell storing said flag information of said common area flag field;

wherein said space number field includes an array of first memory cells connected to said coincidence detection line on a first side of said switching element, for storing said space number values,

wherein said logical address field includes an array of second memory cells connected to said coincidence detection line on a second side of said switching element, for storing said logical address value, and

wherein said switching element is turned off depending on said value of said memory cell storing said flag information so as to provide said coincidence output.

4,812,970

MICROPROGRAM CONTROL SYSTEM

Toshiaki Kitamura, Tokyo; Katsumi Onishi, Kawagoe, and Yuji Oinaga, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

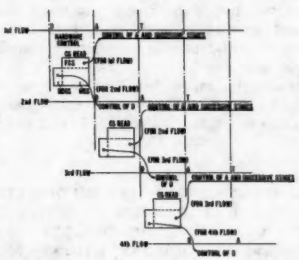
PCT No. PCT/JP84/00533, § 371 Date Jun. 25, 1985, § 102(e) Date Jun. 25, 1985, PCT Pub. No. WO85/02278, PCT Pub. Date May 23, 1985

PCT Filed Nov. 8, 1984, Ser. No. 758,664

Claims priority, application Japan, Nov. 10, 1983, 58-211239; Nov. 10, 1983, 58-211232

Int. Cl.[4] G06F *9/28*

U.S. Cl. 364—200 **13 Claims**



1. A microprogram control method for a multi-flow machine instruction executed by several microinstructions, each microinstruction having plural parts, using a pipeline having a plurality of execution stages each microinstruction part controlling a different stage, and each flow controlled by a different microinstruction, said method comprising the steps of:

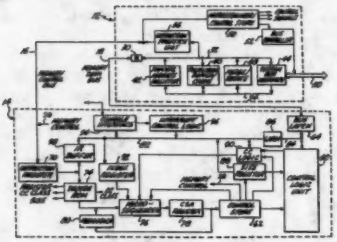
hardware decoding the machine instruction for controlling a first stage of a first flow in said pipeline, fetching a second part of a first microinstruction for controlling second and successive stages in the first flow and fetching a first part of a second microinstruction for controlling a first stage in a second flow, respectively in parallel; and

executing the second part of the first microinstruction, executing the first part of the second microinstruction and fetching a second part of the second microinstruction for controlling the second and successive stages of the second flow, respectively in parallel.

4,812,971
CENTRAL PROCESSING UNIT FOR A DIGITAL COMPUTER

H. Bruce Butts, Jr., Seattle; David N. Cutler, Mercer Island; Peter C. Schnorr, Redmond, and Robert T. Short, Woodinville, all of Wash., assignors to Digital Equipment Corporation, Maynard, Mass.

Division of Ser. No. 782,092, Sep. 30, 1985, abandoned, which is a division of Ser. No. 538,373, Oct. 3, 1983, Pat. No. 4,586,130.
This application Jun. 16, 1988, Ser. No. 207,703
Int. Cl.[4] G06F *9/22, 9/30, 13/00*
U.S. Cl. 364—200 10 Claims



1. A central processing unit for a computer for decoding and executing a macroinstruction including an operation code, said central processing unit comprising:

a control store for storing microinstructions;

a size register;

decode means for decoding the macroinstruction, the decode means including means for providing the address in the control store of the first microinstruction corresponding to the operation code of the macroinstruction, and means for loading the size register with a size code indicating the size of data specified by the operation code; and

a control logic unit for executing a series of microinstructions in response to the decoding of each macroinstruction, said control logic unit comprising:

(i) a plurality of data path elements for carrying parallel digital data; and

(ii) size selection means for selecting the number of data path elements that are used for executing each microinstruction based on the size code in said size register.

4,812,972
MICROCODE COMPUTER HAVING DISPATCH AND MAIN CONTROL STORES FOR STORING THE FIRST AND THE REMAINING MICROINSTRUCTIONS OF MACHINE INSTRUCTIONS

David M. Chastain, Plano, and Gary B. Gostin, Coppell, both of Tex., assignors to Convex Computer Corporation, Richardson, Tex.

Continuation of Ser. No. 622,634, Jun. 20, 1984, abandoned.
This application Aug. 19, 1987, Ser. No. 88,470
Int. Cl.[4] G06F *9/28, 9/32*
U.S. Cl. 364—200 5 Claims

1. A microcode computer wherein each of a plurality of machine instructions is implemented by executing a corresponding series of microinstructions, the computer comprising:

a memory for storing said machine instructions therein,

an arithmetic logic unit which receives and executes said microinstructions but does not receive said machine instructions,

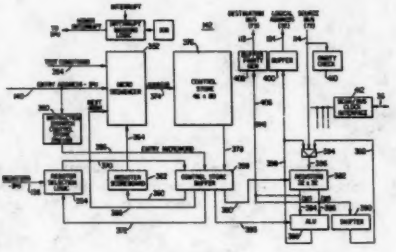
an instruction processing unit for receiving and decoding said instructions received from said memory, to produce an entry address for the first microinstruction corresponding to a decoded machine instruction;

a dispatch control store connected to receive said entry address and having stored therein the first microinstruction for each of said machine instructions, said dispatch control store producing a selected one of said microinstructions stored therein as determined by said entry address,

a main control store for storing therein all of said microinstructions for each of said machine instructions other than the first microinstruction for each of said machine instructions;

a microsequencer for generating addresses for said main control store for producing corresponding microinstructions from said main control store,

a control store buffer connected to receive and store microinstructions from both said dispatch control store and said main control store, said control store buffer providing a



portion of said first microinstruction from said dispatch store to said microsequencer for generating a second microinstruction address for said main control store,

said main control store for providing said second microinstruction and sequentially the remaining microinstructions of said decoded machine instruction to said control store buffer,

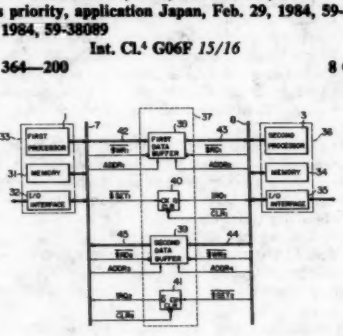
registers connected between said control store buffer and said arithmetic logic unit for transferring said microinstructions from said control store buffer to said arithmetic logic unit for execution therein, and

means for transferring operands between said memory and said arithmetic logic unit in response to said microinstructions executed in said arithmetic logic unit.

4,812,973
MULTIPROCESSOR SYSTEM AND CONTROL METHOD THEREFOR

Kiyoshi Kinoshita, Kokubunji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 27, 1985, Ser. No. 706,276
Claims priority, application Japan, Feb. 29, 1984, 59-38087; Feb. 29, 1984, 59-38089
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—200 8 Claims



1. In a multiprocessor system including at least a first processor and a second processor, in which bidirectional data transfer

is effected between said first processor and said second processor, the improvement wherein said system comprises:

a first data buffer means connected to said first processor and said second processor, for holding a first transfer data from said first processor to said second processor;

a second data buffer means connected to said first processor and said second processor, for holding a second transfer data from said second processor to said first processor;

a first interrupt control means connected to said first processor and said second processor, for providing a first interrupt request signal to said second processor on the basis of write address data fed to said first data buffer from said first processor and a second interrupt request signal to said first processor on the basis of read address data fed to said first data buffer from said second processor; and

a second interrupt control means connected to said first processor and said second processor, for providing a third interrupt request signal to said first processor on the basis of write address data fed to said second data buffer from said second processor and a fourth interrupt request signal to said second processor on the basis of read address data fed to said second data buffer from said first processor;

wherein said first processor is interrupted in response to said second interrupt request signal to write said first transfer data into said first data buffer means, and said second processor is interrupted in response to said first interrupt request signal to read out said first transfer data from said first data buffer means, whereby said first transfer data is transferred from said first processor to said second processor via said first data buffer; and

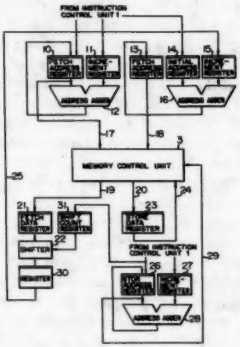
wherein said second processor is interrupted in response to said fourth interrupt request signal to write said second transfer data into said second data buffer means, and said first processor is interrupted in response to said third interrupt request signal to read out said second transfer data from said second data buffer means, whereby said second transfer data is transferred from said second processor to said first processor via said second data buffer.

4,812,974

DATA PROCESSING APPARATUS FOR PROCESSING LIST VECTOR INSTRUCTIONS

Hideo Wada; Shuichi Abe, and Tsuyoshi Watanabe, all of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 29, 1986, Ser. No. 823,531
Claims priority, application Japan, Jan. 29, 1985, 60-14768
Int. Cl.[4] G06F *12/06*
U.S. Cl. 364—200 **1 Claim**



1. A general-purpose computer system having a memory, but no vector registers, comprising:

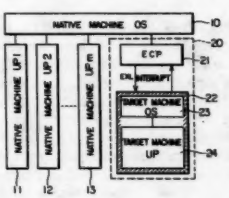
instruction control means responsive to a list vector instruction for providing an increment value of a list vector, an initial address of a second operand vector, an increment value of a first operand vector, an initial address of said list vector and an initial address of a first operand vector; a first register for storing said increment value of a list vector; a second register for storing an increment value of a second operand vector; a third register for storing said initial address of the second operand vector; a fourth register for storing said increment value of a first operand vector; a fifth register for storing a fetch data address, the initial value of which is said initial address of said list vector; a sixth register for storing a store data address, the initial value of which is said initial address of the first operand vector; first adding means for adding the value stored in said first register to the fetch data address stored in said fifth register and for storing as a fetch data address the result of addition representative of an address of the list vector into said fifth register; second adding means for adding the value stored in said second register to a value stored in said third register; third adding means for adding the value stored in said fourth register to the store data address stored in said sixth register and for storing as a store data address the result of addition representative of an address of the first operand vector into said sixth register; bit shift means for performing bit shifting of an element of the list vector read out from said memory in response to the fetch data address stored in said fifth register and for storing a value resulting from the bit shift into said second register; and memory control means for (i) reading out elements of the list vector from said memory at addresses determined by said first adding means adding sequentially values stored in said first register to the fetch data address stored in said fifth register for storing said read-out elements into said second register after bit shift thereof by said bit shift means, and (ii) reading out elements of the second operand vector from the memory at addresses determined by a value obtained by adding sequentially values stored in said second register to the initial address of the second operand vector stored in said third register by said second adding means and for storing said second operand vector elements into memory locations designated by addresses determined by adding sequentially values stored in said fourth register to an address of the first operand vector stored in said sixth register by said third adding means; whereby a list operation specified by a list vector instruction can be executed in which the number of an element of the second operand vector is represented by an element of the list vector.

4,812,975

EMULATION METHOD

Shigemi Adachi, Owariasahi; Yoshitake Nakaosa, Yokohama, and Yoshiki Fujioka, Aichi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 11, 1984, Ser. No. 629,808
Claims priority, application Japan, Jul. 11, 1983, 58-126322
Int. Cl.[4] G06F *9/44*
U.S. Cl. 364—300 **3 Claims**



1. An emulation method for emulating programs in a system having a target machine and a native machine, and in which

data processing is conducted in the target machine with a plurality of programs having a different instruction word set than the native machine, comprising the steps of:

a. detecting an interrupt instruction defined in a first program in which an instruction of said target machine is executed;

b. determining whether or not said interrupt instruction is an input/output control macro instruction by use of an operand and value of said interrupt instruction; and

c. if said interrupt instruction is determined to be an instruction associated with an input/output control macro instruction in said step b, bypassing the operation system of said target machine by translating said input/output control macro instruction from said first program into an input/output control macro instruction for a second program, in which an instruction of said native machine is executed, under control of a program for controlling said emulation.

4,812,976

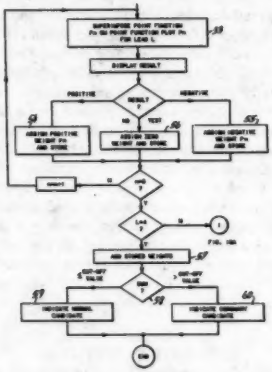
METHOD AND APPARATUS FOR CHARACTERIZING THE UNKNOWN STATE OF A PHYSICAL SYSTEM

Joseph R. Lundy, New York, N.Y., assignor to Lundy Research Laboratories, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 631,743, Jul. 17, 1984, Pat. No. 4,665,485, which is a continuation-in-part of Ser. No. 516,477, Jul. 22, 1983, Pat. No. 4,570,225. This application Jan. 15, 1987, Ser. No. 4,186

Int. Cl.[4] G06F *15/42*

U.S. Cl. 364—413.06 **21 Claims**



1. A method for determining whether a test subject is a candidate for chronic disease comprising the steps of:

subjecting a plurality of electrocardiographic signals representative of a normal state of health which are obtained from control subjects to a pre-defined non-linear coordinate transformation and adjusting said transformation of said plurality of electrocardiographic signals by an offset factor;

constructing an offset standard signature template from a composite of said plurality of transformed and offset electrocardiographic signals, said offset standard signature including a signature comprising a closed multi-dimensional region within a pre-defined coodinate system having an inner boundary and an outer boundary offset from said inner boundary;

subjecting an electrocardiographic signal representative of the state of health of the test subject to said pre-defined non-linear coordinate transformation of said electrocardiographic signal by said offset factor;

constructing an offset response signature plot from said transformed and offset electrocardiograhic signal; and

determining whether the test subject is a candidate for chronic disease by comparing the offset response signature to the offset standard signature including effecting an overlay of said offset plot over said offset template.

4,812,977

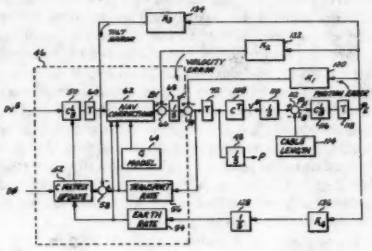
BOREHOLE SURVEY SYSTEM UTILIZING STRAPDOWN INERTIAL NAVIGATION

Rand H. Hulsing, II, Redmond, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Dec. 31, 1986, Ser. No. 948,058

Int. Cl.[4] E21B *47/022*

U.S. Cl. 364—422 **34 Claims**



1. A signal processing method for use in borehole surveys of the type wherein a probe supplies inertial acceleration signals representative of probe inertial acceleration relative to the three axes of a first coordinate system that is referenced to said probe and angular rate signals representative of angular rotation of the probe about the three axes of the first coordinate system as the probe is moved along a borehole by a cable, said signal processing method comprising the steps of:

(a) transforming said acceleration signals in said first coordinate system to obtain inertial signals representative of movement of said probe in a second coordinate system that is fixed relative to the earth, said inertial signals in said second coordinate system including probe velocity signals;

(b) generating a signal representative of the amount of cable being fed into the entrance opening of said borehole;

(c) processing said signal representative of the amount of cable being fed into said entrance opening of said borehole to obtain a signal that is representative of the progress of said probe along said borehole and is corrected for cable stretch and misalignment of the probe in the borehole and of the probe relative to the first coordinate system;

(d) transforming said inertial signals representative of movement of said probe in said second coordinate system into inertial signals representative of movement of said probe in said first coordinate system;

(e) combining said signal representative of said progress of said probe along said borehole with said inertial signals representative of movement of said probe in said first coordinate system to obtain error signals;

(f) transforming said error signals into said second coordinate system to obtain error correction signals;

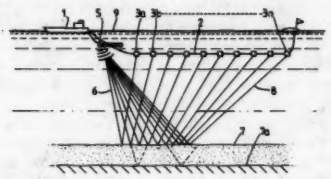
(g) combining said error correction signals with said inertial signals representative of movement of said probe in said second coordinate system to obtain corrected probe velocity signals; and

(h) integrating said corrected probe velocity signals to obtain signals representative of the course of said borehole relative to said second coordinate system.

4,812,978
DATA PROCESSING METHOD, PREFERABLY FROM SEISMIC STREAMERS

Paul Fredriksen, Asker, Norway, assignor to Geophysical Company of Norway A.S., Sandvika, Norway

Filed Jun. 16, 1986, Ser. No. 874,634
Claims priority, application Norway, Jun. 17, 1985, 852447
Int. Cl.[4] G01V 1/28
U.S. Cl. 364—421 6 Claims



1. A method for the reduction of data logging in seismic data processing, in which data are transmitted between a plurality of data acquisition means with a plurality of channels and a central receiving and recording means, by using a plurality of transmissions modules each of which is essentially allocated to a data acquisition means and each channel is assigned corresponding seismic traces comprising:

providing real physical seismic traces and synthetic seismic traces;

inserting the synthetic traces between the real traces;

locating the seismic traces with relative uniform, physical distance;

assigning corresponding simulated channels to the synthetic traces;

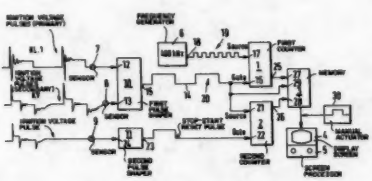
assigning to each simulated channel an estimate of the real value for a corresponding physical channel; and

adapting each estimated value to the values of at least one adjacent physical channel assigned the corresponding real physical traces.

4,812,979
METHOD AND APPARATUS FOR ANALYZING THE PERFORMANCE OF THE ELECTRONIC IGNITION OF AN INTERNAL COMBUSTION ENGINE

Horst Hermann, Oberasbach; Wilhelm Binöder, Veitsbronn; Armin Rech; Gerd Rech, both of Heusweiler, and Günter Reinhardt, Zirndorf, all of Fed. Rep. of Germany, assignors to Horst Hermann Company, Fed. Rep. of Germany

Filed Feb. 14, 1986, Ser. No. 829,222
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1985, 3505440
Int. Cl.[4] G01M 15/00; F02P 17/00
U.S. Cl. 364—431.01 13 Claims

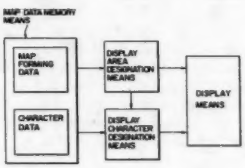


10. An apparatus for electrically sensing the operational state of a multi-cylinder internal combustion engine having an electronic ignition system comprising: first counter means operatively connected to the electronic ignition system for generating in sequence first numerical values related to engine cylinder speed including means for determining a time interval between first and second consecutive ignition voltage pulses supplied to different cylinders; second counter means operatively connected to the electronic ignition system for generating in sequence second numerical values by counting the number of ignition pulses supplied to said cylinders of said engine, and arranged to reset a second numerical value to "1" at each counting of an ignition pulse supplied to a selected cylinder; memory means operatively connected to said first and second counter means for storing said first and second numerical values in digital form for a predetermined length of time greater than the length of time to supply an ignition pulse to any one cylinder; computer means operatively connected to said memory means and arranged to convert said first numerical values into engine speed values representing a value of engine speed for each cylinder; and display means operatively coupled to said computer means and arranged to display said engine speed values in graphical form as a stationary image, said stationary image comprising said engine speed values arranged in sequential order of cylinder ignitions.

4,812,980
MAP DISPLAY SYSTEM

Takeshi Yamada, Seto; Hidetoshi Fujimoto, Toyokawa; Kenzo Ito, Okazaki, and Kazunori Hanabusa, Kasugai, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 15, 1986, Ser. No. 863,520
Claims priority, application Japan, May 16, 1985, 60-104637
Int. Cl.[4] G06F 15/50; G09B 29/00
U.S. Cl. 364—449 3 Claims



1. A map display system comprising:

memory means for storing map-forming information required for display of a map of a predetermined area and storing coordinates of a predetermined spot within said predetermined area and a display character code representing the name of the predetermined spot, said display character code being formed by a plurality of letters, the entirety of each said display character code being associated with said coordinates of said predetermined spot corresponding to said display character code;

designating means for designating a scale of the map;

display means for displaying the map; and

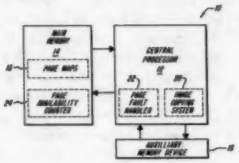
display control means for reading out the mapforming information from said memory means and for causing said display means to display the map of the scale designated by said designating means, said display control means further causing said display means, in accordance with the coordinates and the display character code of the predetermined spot stored in said memory means, to perform a character display of said name on a position corresponding to said coordinates of the predetermined spot on the map displayed by said display means, said character display being positioned in accordance with the coordinates of the predetermined spot, the size of the characters and an interval between adjacent characters being maintained at a fixed value regardless of the scale designated by said designating means.

4,812,981

MEMORY MANAGEMENT SYSTEM IMPROVING THE EFFICIENCY OF FORK OPERATIONS

Carl Chan, Framingham, and Edwar A. Feustel, Sherborn, both of Mass., assignors to Prime Computer, Inc., Natick, Mass.

Filed Oct. 24, 1985, Ser. No. 790,839
Int. Cl.[4] G06F *15/00, 12/12*
U.S. Cl. 364—200 10 Claims



8. A process image copying system for copying a parent process having pages of information into a child process during a fork operation in a data processing system which employs virtual addressing to reference a physical memory, at least one page map to define the relationship between virtual addresses and their physical locations, and demand paging to allocate a logic address space, which address space defines a process (or task), distributed between a main memory and a lower density auxiliary memory, the pages of the parent process distributed in the main memory and the auxiliary memory wherein said pages resident in the main memory comprise modified and unmodified pages, the process copying system comprising;

a. redefining means for redefining the unmodified pages of the parent process resident in main memory as pages of the child process;

b. map modifying means for modifying the page map in response to page redefinitions by the redefining means;

c. copying means for copying pages of the parent process not resident in the main memory to create pages for the child process in said logic address space; and

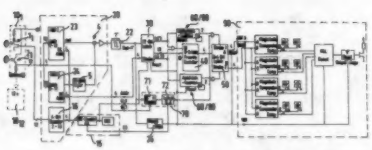
d. central processing means connected to said redefining means, said map modifying means, and said copying means for controlling and coordinating the activities of each of said means.

4,812,982

APPARATUS FOR RECOGNIZING CODE MARKS

Walter PeBenhofer, 8020 Graz, Weissenkircherstrasse 23, Graz, Austria

Filed Dec. 16, 1986, Ser. No. 942,343
Claims priority, application Austria, Dec. 16, 1985, A 3627/85
Int. Cl.[4] G06F *15/20*; B65G *47/00*
U.S. Cl. 364—478 11 Claims



1. An apparatus for recognizing a position of an article having a plurality of code marks by determining the relative positions of the code marks in respect to each other, comprising:

means for adjusting positions of said code marks such that the code marks are spaced a plurality of discrete distance increments from each other;

a read station including at least first and second code readers for recognizing positions of at least two of said code marks relative to a third of said code marks, said first and second code readers being spaced at a distance corresponding to a plurality of said discrete distance increments, each of said code readers generating output signals, and wherein said output signals include first signals indicative of the presence of a code mark at a code reader and second signals indicative of the absence of a code mark at a code reader:

an address counter;

a multiplexer system controlled by said address counter to sequentially interrogate said code readers and serially obtain said output signals of said code readers;

a buffer memory connected to an output of said multiplexer system to store said output signals at addresses corresponding to the positions of the code readers;

a priority encoder connected to an output of said buffer memory, said priority encoder generating output signals corresponding to an address of the serially highest of said first signals indicative of the presence of a code mark;

first and second end buffer memories connected to the output of said priority encoder, said end buffer memories having parallel inputs;

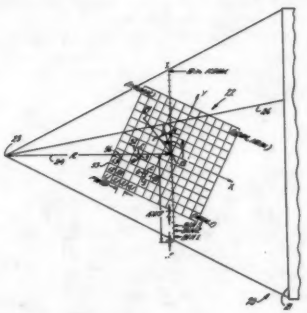
wherein said first and second end buffer memories are controlled by first and second pulse generators so that the first end buffer memory receives said priority encoder output signals in response to output by said first code reader of said first signal indicative of the presence of a code mark at said first code reader, and so that the second end buffer memory receives the priority encoder output signals in response to output by said first and second code readers of subsequent first signals indicative of the presence of a code mark at said second code reader, whereby the priority encoder output signals received by said second end buffer memory in response to the subsequent first signal indicative of the presence of a code mark at said second code reader correspond to the relative positions of the code marks.

4,812,983

METHOD AND MEANS OF CORRECTING FOR A SHIFT IN THE CENTER OF ROTATION OF A ROTATING FAN BEAM CT SYSTEM

Grant T. Gullberg, Salt Lake City, Utah, and Carl R. Crawford, Milwaukee, Wis., assignors to General Electric Company, Waukesha, Wis.

Continuation-in-part of Ser. No. 688,486, Jan. 3, 1985, Pat. No. 4,703,424. This application Jul. 31, 1986, Ser. No. 892,774
Int. Cl.[4] G06F *15/42*
U.S. Cl. 364—413.17 17 Claims



1. In a fan beam computed tomographic system having a detector system for taking a plurality of projections at a plurality of angles, each projection defining a plurality of projection bins, the computed tomographic system having a given center of rotation which is shifted from the midline of the fan by a

shift distance which varies as a function of projection angle, a method of compensating for the shift in performing the computed tomographic reconstruction comprising the steps of, producing a weighting function for each projection bin in each projection set which is dependent on the detector geometry and the magnitude of the shift for the respective projections, weighting the information in each projection bin with its associated weighting function to produce corrected projection sets, convolving the corrected projection sets with a filter function to produce convolved corrected projection sets, setting up a corrdinate system in pixelized space taking into account the shift and its variance as a function of projection angle, and back projecting the convolved corrected projection sets into the pixelized space using said coordinate system to produce a CT image corrected for the variable shift.

7. In a fan beam computed tomographic system having a detector system for taking a plurality of projections at a plurality of angles, each projection defining a plurality of projection bins, the computed tomotographic system having a given center of rotation which is shifted from the midline of the fan by a shift distance which varies as a function of projection angle, an improved apparatus for compensating for the shift in performing the computed tomographic reconstruction comprising means for producing a weighting function for each projection bin in each projection set which is dependent on the detector geometry and the magitude of the shift for the respective projections, means for weighting the information in each projection bin with its associated weighting function to produce corrected projection sets, means for convolving the corrected projection sets with a filter function to produce convolved corrected projection sets, means for setting up a coordinate system in pixelized space taking into account the shift and its variance as a function of projection angle and means for back projecting the convolved corrected projection sets into the pixelized space using said coordinate system to produce a CT image corrected for the variable shift.

13. In a fan beam computed tomographic reconstruction system having a detector system for taking a plurality of projections at a plurality of angles, and defining a set of geometric parameters including a distance between the apex of the fan and the detector, a distance between the apex of the fan and the center of rotation of the detector, a position of a point on the detector defined by the midline of the fan, and a center of rotation shifted with respect to said projection as a function of projection angle, a method of estimating said geometric parameters comprising the steps of, providing a point response at an unknown point for sensing by the detector, taking a set of projections of the point response at a plurality of angles by rotating the detector about its center of rotation, determining the cenroid of each projection, setting up a series expansion relating the shift as a function of projection angle to a series of expansion coefficients, establishing a function relating the centroid for each angle to said geometric factors, said expansion coefficients, and an estimated position of said points; determining the error between the centroid of the point response determined from the projection information and said function, and iteratively determining the set of expansion coefficients and geometric parameters which minimize said error for use in the reconstruction process.

4,812,984

METHOD AND DEVICE FOR MEASURING THE CUTTING FORCES AND LIMITING OVERLOADS OF THE CUTTING FORCE IN A PLATEN PRESS

Marcel Yerly, Chavannes, and Klaus Christl, Ecublens, both of Switzerland, assignors to Bobst SA, Lausanne, Switzerland

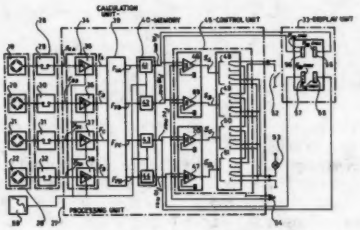
Filed Feb. 12, 1987, Ser. No. 14,243

Claims priority, application Switzerland, Feb. 13, 1986, 580/86

Int. Cl.[4] G01L *25/00*; G06G *7/66*

U.S. Cl. 364—474 **11 Claims**

1. A method for measuring the cutting forces and limiting the overloads of a platen press with the steps comprising providing a platen press having a pair of lateral frames supporting four deformation reading sensors and being held apart by a fixed upper stationary bed and a lower cross member, said press having pressing means having a crankshaft and driven by a motor positioned on the lower cross member to actuate toggles to move a lower shiftable bed towards the fixed upper bed, said press having control means including a processing unit having two directional amplifiers and four output amplifiers, a memory unit with a plurality of outputs, and a comparator for each of the outputs of the memory unit; calibrating the deformation reading sensors by positioning a first jack in the center of the shiftable bed and operating the first jack to engage the fixed platen, and then setting the sensors at a zero value as the first jack engages the fixed bed; determining a correction factor for the geometry of the lateral frame members by placing the first jack under pressure, measuring the deformation of the lateral frames at the location of the sensors and then calculating the correction factors; removing the pressure of the first jack and replacing the first jack with a second jack offset by a known value in X and Y directions



between the lower shiftable bed and the upper bed; actuating the second jack to apply pressure between the fixed upper bed and the shiftable bed, measuring the force of deformation from each of the sensors, calculating a first fictitious lever arm for the forces measured by the sensors, and calculating a second fictitious lever arm for the forces acting on each of the toggles, combining the values of the first and second fictitious lever arms, determining the gain of the two directional amplifiers in the control unit and with the known axial distance between the bearings of the crankshaft for the pressing means calculating the forces acting on the bearings, and determining the correcting factors for the output amplifiers; memorizing the maximum value of the forces acting in the bearing, displaying the maximum value of the forces acting on the bearings of four scale members of a display unit and comparing the maximum allowable value to the maximum measured value, creating an overload signal when the measured value exceeds the allowable value and applying the overload signal to a relay system to stop the motor of the press; and then resetting the processing and memory units when repeating the cycle.

4,812,985

ARTICLE STORAGE AND RETRIEVAL SYSTEM

Paul R. Hambrick, Plano; Martin Wagner, Garland, and Kerry W. Whitaker, Plano, all of Tex., assignors to Ja-Pac, Inc, Plano, Tex.

Filed Sep. 15, 1986, Ser. No. 907,394

Int. Cl.[4] G06F *15/24*; B65G *1/06*

U.S. Cl. 364—478 **20 Claims**

1. A system for the repetitive storage and retrieval of articles, comprising:

an indicia bearing label affixed to each article to be repeatedly stored and retrieved, said indicia being representative of information uniquely identifying its associated article;

means for receiving articles to be stored from a user;

means for delivering articles retrieved from storage to a user;

means responsive to the delivery of an article to said receiv-

ing means for automatically moving said article to a scanning location which is inaccessible to the user;

means for automatically reading the identifying information contained by the indicia on the label affixed to said article positioned in the inaccessible scanning location;

means for storing articles having a plurality of individual storage locations, each of said locations being identified by a unique address;

memory means;

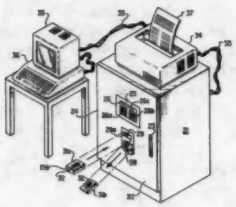
central processing means including:

means for receiving information from said indicia reading means and assigning and storing in said memory a unique storage location address within said storing means for each article delivered to said receiving means; and

means responsive to the reading of indicia information on an article label for comparing said information to data stored in said memory;

means responsive to said comparing means locating a match for automatically moving the associated article from said scanning location to the assigned storage location within said storing means; and

means responsive to said comparing means not locating a match for first assigning an available storage location to said article and then automatically moving said article from said scanning location to the assigned available storage location within said storage means.



4,812,986

APPARATUS FOR DISPENSING MONEY ORDERS

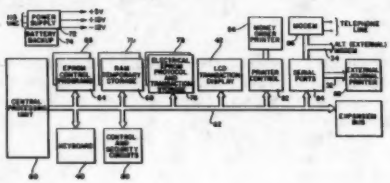
Lawrence G. Smith, Orlando, Fla., assignor to Republic Money Orders, Inc., Dallas, Tex.

Division of Ser. No. 877,539, Oct. 31, 1986, Pat. No. 4,699,532, which is a division of Ser. No. 596,291, Apr. 3, 1984, Pat. No. 4,625,275. This application Jun. 8, 1987, Ser. No. 60,762

The portion of the term of this patent subsequent to Nov. 16, 1999, has been disclaimed.

Int. Cl.[4] G06F *15/21, 15/30;* **B41J** *5/00*

U.S. Cl. 364—479 **11 Claims**



1. A method for securing a money order dispenser having a digital processor for controlling the operation of the dispenser, a keyboard for entering transaction data, a memory associated with said processor, and a printer for printing alphanumeric indicia on a money order, comprising the steps of:

(a) defining one or more events associated with said dispenser for indicating that the security of the dispenser has been compromised, the occurrence of any of said events defining a compromised condition;

(b) storing a security inhibit printing code in said memory for controlling the operation of said printer;

(c) determining whether the dispenser is in a compromised condition; and

(d) if a compromised condition exists, changing said security inhibit printing code to inhibit operation of said printer.

4,812,987

WAVE SHAPING CIRCUIT

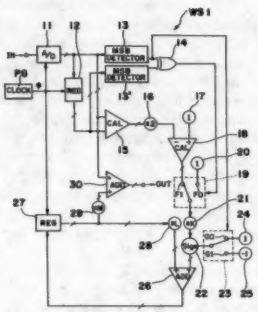
Chiaki Yamawaki, Nara; Taizo Sasada, Hirakata; Tetsuo Iwaki, Tenri, and Katsubumi Koyanagi, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 5, 1985, Ser. No. 795,231

Claims priority, application Japan, Nov. 6, 1984, 59-234263; Oct. 16, 1985, 60-231978

Int. Cl.[4] G06F *7/38;* **H03B** *1/00*

U.S. Cl. 364—724.01 **8 Claims**



1. A wave shaping circuit comprising:

digital sampling means for sampling an input signal and producing a digital signal;

sign detecting means responsive to said digital sampling means for detecting whether the sampled digital signal has a positive value or a negative value;

unit difference generating means responsive to said sign detecting means for generating a unit difference which is equal to a difference increase, during one sampling cycle, in a positive or negative direction, as detected by said sign detecting means;

storing means for storing a summed difference obtained in a previous sampling cycle;

multiplying means for multiplying said summed difference with a predetermined coefficient which is between 0 and 1 to produce an adjusted summed difference;

first adder means responsive to said multiplying means and said unit difference generating means, for adding said adjusted summed difference with said unit difference, and for supplying the added result of said first adder means to said storing means to cause storing of this added result; and

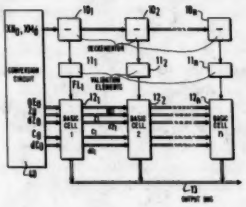
second adder means responsive to said storing means and said digital sampling means, for adding said digital signal with said summed difference stored in said storing means to produce a corrected signal.

4,812,988

PROCESSOR FOR THE ELIMINATION OF CONCEALED FACES FOR THE SYNTHESIS OF IMAGES IN THREE DIMENSIONS

Olivier Duthuit, Paris; Thierry Bonnet, Champigny, and Philippe Martin, Fresnes, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 29, 1986, Ser. No. 902,372
Claims priority, application France, Aug. 30, 1985, 85 12925
Int. Cl.[4] G06F *15/72*
U.S. Cl. 364—522 12 Claims



1. An image processor for processing a three-dimensional representation of an object to determine two-dimensional representation parameters to permit displaying an image of the represented object on a display screen, said image processor comprising:

means for inputting a plurality of sets of parameters each set corresponding to a single polygon in a plurality of polygons which represent said three-dimensional object at a predetermined angle of observation, each set of parameters defining a set of line segments which constitute the intersection of each polygon with a plurality of planes perpendicular to a plane of visualization through each line of visualization on the display screen, the plane of visualization corresponding to the plane of the display screen and the line of visualization corresponding to a line of visual elements on the display screen; and

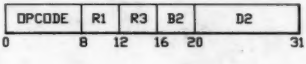
means for determining the parameters of a plurality of visual elements in a line of visualization comprising means for simultaneously determining the parameters of a plurality of line segments and means for serially processing each parameter in a set of parameters, said serial processing being of the pipeline type, and for selecting and storing the parameters of line segments closest to the plane of visualization.

4,812,989

METHOD FOR EXECUTING MACHINE LANGUAGE INSTRUCTIONS

Robert M. Maier, San Jose; Allan J. Zmyslowski, Sunnyvale, and Carolee N. Schober, Cupertino, all of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed Oct. 15, 1986, Ser. No. 919,208
Int. Cl.[4] G06F *7/00, 9/28, 9/20*
U.S. Cl. 364—200 6 Claims



1. For use in a data processor, a method for mapping a respective machine language instruction stored by cache storage unit means to a respective microprogrammed algorithm stored by control storage unit means, wherein the respective machine language instruction includes an opcode field with a prescribed value and includes at least one nonopcode field with one of a plurality of values, the method comprising the steps of:

in the course of one data processor clock cycle,

(i) providing the respective machine language instruction to means for converting the prescribed opcode field and the at least one nonopcode field of the respective machine language instruction into a respective first combination of signals which corresponds to the prescribed opcode field value and the at least one nonopcode field value of the respective machine language instruction; and

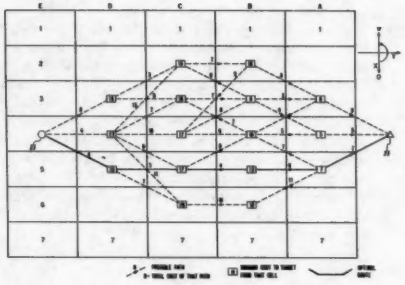
(ii) providing the respective first combination of signals to combinational logic means for coverting the respective first combination of signals into a respective address signal which points to a microprogrammed algorithm stored in the control storage unit means.

4,812,990

SYSTEM AND METHOD FOR OPTIMIZING AIRCRAFT FLIGHT PATH

Daniel R. Adams, Richardson, and Richard E. McKenzie, Arlington, both of Tex., assignors to Merit Technology Incorporated, Plano, Tex.

Filed Apr. 29, 1987, Ser. No. 44,059
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—444 10 Claims



5. A method for determining the optimal path for an aircraft to fly from a first position to a second position so that the aircraft heading at the second position is within preselected minimum and maximum heading limits, said method comprising the steps of:

constructing a refereene grid, the length of which is oriented along a first axis connecting said first and second positions so that the first axis corresponds to the centerline of the grid and the width of which corresponds to a preselected width along a second axis which is perpendicular to said first axis, said grid being divided into N number of ranks in succession between said first and second positions, said first position being at the center of the first rank and said second position being adjacent to the center of the Nth rank, each of said ranks spanning the entire width of said grid and being divided into a predetermined number of rectangular cells;

determining connected cells in said Nth rank, the connected cells in the Nth rank being those cells from which the aircraft can reach said second position within the preselected minimum and maximum heading limits without exceeding the maximum lateral acceleration allowed for the aircraft;

determining the cost of flying from each of the conencted cells in the Nth rank to said second position based on a preselected cost function;

determining the corresponding heading limits at each of the connected cells in the Nth rank, said heading limits representing a range of allowed headings for the aircraft at the corresponding connected cell in the Nth rank from which

the aircraft can reach the second position within the preselected minimum and maximum heading limits; and

performing the following steps for each pair of adjacent ranks in sequence beginning with i=N and ending with i=2;

determining connected paths between each pair of adjacent ranks (i−1) and i, each of said connected paths representing a discrete connection between a specified cell in the (i−1)th rank and a specified connected cell in the ith rank whereby the aircraft can reach the specified cell in the ith rank within the corresponding heading limits from the specified cell in the (i−1)th rank without exceeding the maximum lateral acceleration, each of the cells in the (i−1)th rank from which the aircraft can reach at least one of the connected cells in the ith rank within the corresponding heading limits without exceeding the maximum lateral acceleration being a connected cell in the (i−1)th rank;

determining the cost of flying from the (i−1)th rank to the ith rank along each of said connected paths and determining the minimum cost of flying from each of the connected cells in the (i−1)th rank to said second position based on the preselected cost function;

storing the corresponding path of minimum cost between each connected cell in the (i−1)th rank and the second position and the corresponding cost of said minimum cost path for each of the connected cells in the (i−1)th rank; and

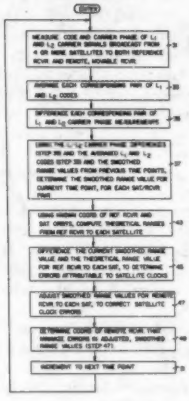
determining corresponding minimum and maximum heading limits for each of the connected cells in the (i−1)th rank, said heading limits representing a range of allowed headings for the aircraft at the corresponding connected cell in the (i−1)th rank which will enable the aircraft to reach a particular one of the connected cells in the ith rank with the corresponding heading limits without exceeding the maximum lateral acceleration, said particular connected cell in the ith rank being that cell which lies on the path of minimum cost between the corresponding connected cell in the (i−1)th rank and the second position.

4,812,991

METHOD FOR PRECISION DYNAMIC DIFFERENTIAL POSITIONING

Ronald R. Hatch, Wilmington, Calif., assignor to Magnavox Govt. and Industrial Electronics Company, Fort Wayne, Ind.

Filed May 1, 1986, Ser. No. 858,206
Int. Cl.[4] G01S *5/02*
U.S. Cl. 364—458 **10 Claims**



1. A method for determining the coordinates of a remote receiver relative to a reference receiver having known coordinates, the method using the modulated L_1 and L_2 carrier signals broadcast from four or more GPS satellites, the method comprising steps of:

measuring the range to each of the four or more satellites from both the reference receiver and the remote receiver, at each of a succession of time points, the step of measuring including steps of

detecting the L_1 and L_2 codes, to produce a code measurement for each satellite/receiver pair, at each time point, the code measurement being based on a predetermined linear combination of the detected L_1 and L_2 codes, and

detecting the L_1 and L_2 carrier phases, to produce a carrier phase measurement for each satellite/receiver pair, at each time point, the carrier phase measurement being based on a predetermined linear combination of the detected L_1 and L_2 carrier phases,

wherein the predetermined linear combinations of the detected L_1 and L_2 codes and carrier phases are selected such that the ionosphere affects the resulting code and carrier phase measurements substantially equally;

smoothing the successive code measurements for each satellite/receiver pair in accordance with the corresponding carrier phase measurements for the same time point and in accordance with the code measurements and carrier phase measurements for previous time points, to produce a smoothed code measurement for each satellite/receiver pair, at each time point;

comparing the successive smoothed code measurements for the reference receiver with theoretical range values based on the known coordinates of the reference receiver and known orbits of the four or more satellites, to produce an error value for each smoothed code measurement for the reference receiver;

determining the errors in the internal clocks of each of the four or more satellites, based on the error values produced in the preceding step of comparing;

adjusting the successive smoothed code measurements for the remote receiver, to eliminate the effects of the satellite clock errors determined in the preceding step of determining and thereby produce a succession of corrected range measurements for each satellite; and

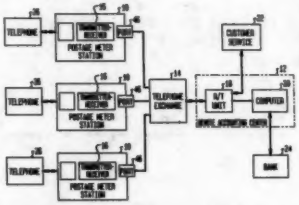
determining the particular coordinates of the remote receiver that minimize errors in the successive corrected range measurements.

4,812,992

POSTAGE METER COMMUNICATION SYSTEM

Anthony Storace, Norwalk, Conn., and Donatas Gasiunas, Carmel, N.Y., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed May 10, 1986, Ser. No. 850,478
Int. Cl.[4] G06F *15/20, 9/18*
U.S. Cl. 364—464.02 **6 Claims**



1. A remotely rechargeable electronic postage meter having a communication port, an accounting circuit including a descending register, communication control means coupled to said accounting circuit for applying dialling signals and coded identification signals to said communication port, said dialling

signals corresponding to a data center and said identification signals including data identifying said meter and data dependent upon the contents of said descending register, said control means comprising means responsive to the receipt of determined coded signals at said port for modifying the contents of said register to correspond to a determined higher postage printing value authorization, and a manually controllable switch means on said meter means and coupled to said control means, said control means comprising first means responsive to operation of said switch means for automatically applying said dialling signals and identification signals to said communication port whenever the contents of said descending register are at a value less than a predetermined value and third means responsive to the operation of said switch means when said register has a value higher than said lesser value for applying dialling signals corresponding to a service center to said port, thereby enabling establishment of a telephonic path to said service center to permit oral communication between said service center and telephone means coupled to said port.

4,812,993

METHOD AND MEANS FOR CONTROLLING THE DRAFTING OF SLIVER IN A DRAW FRAME

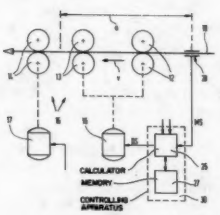
Herbert Konig, Ebersbach, and Gerhard Stahle, Adelberg, both of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Jun. 4, 1987, Ser. No. 57,949

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1986, 3619248

Int. Cl.[4] G01B *13/04;* **D01H** *5/52*

U.S. Cl. 364—470 **10 Claims**



1. In a method of controlling the drafting of sliver in a draw frame, which method includes sensing variation in mass characteristics of traveling sliver in advance of drawing and varying drafting in response to said sensing at a time delay related to the time of travel of sliver from the sensing to the drafting, the improvement comprising determining a correction time as a function of the characteristic of sliver mass variation sensed by said sensing and subtracting said correction time from said travel time to determine said delay time.

4,812,994

POSTAGE METER LOCKING SYSTEM

Michael P. Taylor, and Wojciech M. Chronsny, both of Norwalk, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation of Ser. No. 762,989, Aug. 6, 1985, abandoned. This application Nov. 20, 1987, Ser. No. 124,392

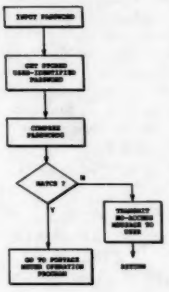
Int. Cl.[4] G06F *7/04, 15/20*

U.S. Cl. 364—464.02 **22 Claims**

1. In a postage metering system including printing means, accounting means including means for controlling the printing means, the accounting means including means for storing a postage value which may be dispensed, and the accounting means including means for decreasing the stored value by respective amounts corresponding to postage dispensed, an improvement for securing the accounting means against unauthorized use, the improvement comprising:

a. means for communicating with said accounting means, said communicating means including means for inputting at least one user identity password to the accounting means; and

b. said accounting means including a secure memory, said memory having stored therein at least one user identity code, said accounting means including means for comparing said at least one code and said at least one password,



said accounting means including means for permitting use thereof if the comparison indicates that said at least one code and said at least one password match, and said accounting means including means for preventing use thereof if the comparison indicates that said at least one code and said at least one password do not match.

4,812,995

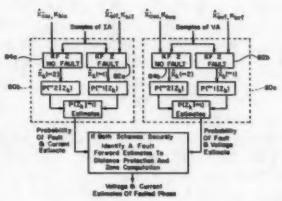
ADAPTIVE KALMAN FILTERING IN FAULT CLASSIFICATION

Adly A. Girgis, 103 Briarcliff Rd. Rt. 190 3 Box 78-C, Central, S.C., and Robert G. Brown, Rural Rt. 1 Sky Crest Dr., Ames, Iowa

Filed May 19, 1987, Ser. No. 52,603

Int. Cl.[4] G06F *15/20;* **G01R** *31/08*

U.S. Cl. 364—481 **7 Claims**



1. A method of digital distance relaying on a three phase electric power transmission system comprising the steps of:

successively sampling line values from each line of said transmission system, and comparing said values with corresponding sample values taken one cycle earlier;

electronically detecting an abnormality on said transmission line from a comparison of said samplings;

recursively electronically processing line current data samples and line voltage data samples of each phase of said transmission line in respective current and voltage Adaptive Kalman filter schemes, each filter scheme including two parallel Adaptive Kalman filter models, one of said Adaptive Kalman filter models assuming features of a fault condition existing on said line and the other Adaptive Kalman filter model assuming features of an unfaulted condition existing on said transmission line, each of said current and voltage Adaptive Kalman filter schemes indi-

vidually having a probability factor associated therewith indicative of a probability as to whether the respective Adaptive Kalman filter models an actual line condition, when a probability associated with a voltage Adaptive Kalman filter model and a probability associated with a current Adaptive Kalman filter model for a same condition exceed some predetermined value and if said condition is a faulted condition then respective current and voltage waveform sinusoid estimates;

determining whether said voltage and current waveform sinusoid estimates indicate that said fault lies within a predetermined zone; and

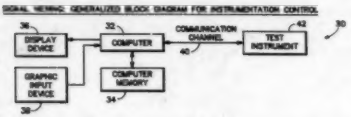
tripping circuit breaking means for a section of said transmission line corresponding to said zone when said voltage and current waveform sinusoid estimate indicates that said fault lies within said predetermined zone, in automatic response to said determining step.

4,812,996

SIGNAL VIEWING INSTRUMENTATION CONTROL SYSTEM

David D. Stubbs, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 26, 1986, Ser. No. 935,369
Int. Cl.[4] G06F *15/74*; G01R *23/00*
U.S. Cl. 364—487 **38 Claims**



1. A method for controlling a test instrument including a first processor and having a predetermined set of programmable control settings, including:

providing a computer including a second processor and having external communications means for transmitting control setting commands from the second processor to the first processor, user input means for a user to enter data to the computer, and a memory;

storing, in the computer memory, data defining a transformation function of the test instrument for inversely transforming a generic output for the instrument into a generalized set of said control setting commands for controlling operation of the instrument;

entering, in the computer, data that defines a user-specified output for the instrument;

inversely transforming the user-specified output in accordance with the transformation function to produce, in the second processor, a specific set of said control setting commands; and

transmitting the specific set of control setting commands to the first processor to operate the test instrument in accordance with specific control settings that cause it to produce an output replicating the user-specified output.

4,812,997

CONTROL APPARATUS FOR AN AIR CONDITIONING SYSTEM

Kastuhiko Okochi, Shiga; Mitsuo Toya, Otsu; Masahito Naito, Uji; Yoshiaki Inoue, and Takahiro Egusa, both of Kusatsu, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Filed Apr. 9, 1987, Ser. No. 36,428
Claims priority, application Japan, Apr. 10, 1986, 61-82556
Int. Cl.[4] G06F *15/20*; F28F *27/00*
U.S. Cl. 364—505 **4 Claims**

1. A control apparatus for an air conditioning system comprising:

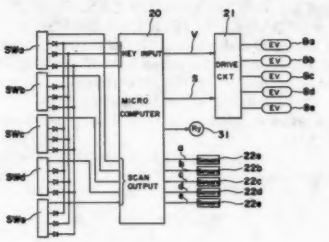
an outdoor unit which has a compressor, a condenser to receive refrigerant transferred from said compressor, a liquid refrigerant pipe which is connected to said condenser at one end thereof and is divided into a plurality of branch pipes at the other end thereof, and at least one motorized valve being disposed in each of the branch pipes, the motorized valves controlling a quantity of refrigerant flowing in said branch pipes;

a plurality of indoor units which have respective evaporators, and which are connected to individual branch pipes through connection pipes;

operation request signal output means for outputting an operation request signal indicating which of the indoor units is required to operate;

specifying means for specifying which indoor units are required to be operated in response to the request signal from the operation request signal output means, said specifying means outputting a signal indicative of the specified indoor units;

counting means for counting the number of the indoor units required to operate in accordance with the request signal from said operation request signal output means;



valve-opening control means provided with a table representing degrees of valve opening for each of the motorized valves, the degrees being predetermined relative to a number of indoor units required to operate in a manner that valve openings decrease in steps as the number of indoor units required to operate increases, the valve openings also increasing in steps as the number of indoor units required to operate decreases, the valve opening means looking up the table to get the degree of valve opening corresponding to the number of the indoor units decided by the counting means and based on the signal indicative of the indoor units, said valve-opening control means outputting a signal representative of the degree of valve opening; and

drive circuit means for driving said motorized valves for the indoor units required to operate in response to the signal outputted from said specifying means and for controlling the motorized valves to open to the degree decided by the valve-opening control means in response to the signal outputted from the valve-opening control means.

4,812,998

DISPLAY TERMINAL CONTROL SYSTEM

Satoru Maeda, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 26, 1985, Ser. No. 748,958
Claims priority, application Japan, Jul. 2, 1984, 59-136677
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—518 **7 Claims**

1. A display terminal control system for an image information terminal comprising:

system control means;

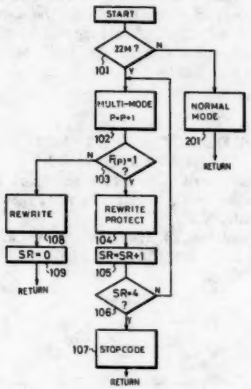
display control means connected to said system control means and having a display buffer memory, said system control means managing the operation of said display buffer means;

coupling means connected to said system control means for

connecting said image information terminal to a data center;

said display buffer memory comprising plural memory locations for storing successively arriving blocks of data corresponding to pictorial images by overwriting data previously stored therein;

a keyboard connected to said system control means; and



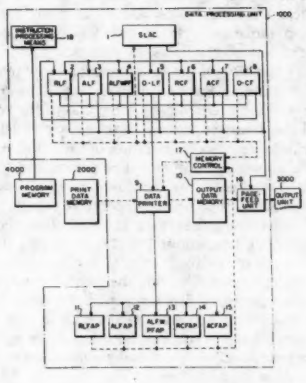
means connected to and responsive to said keyboard for causing successively arriving data blocks to be stored in less than all of said memory locations, whereby at least one memory location selectively stores data which is not overwritten by said arriving blocks of data, whereby selective operation of said keyboard enables a multi-image display having at least a fixed portion thereof corresponding ot one of said successively arriving blocks of data.

4,812,999

DATA OUTPUT CONTROL SYSTEM

Sinji Ohara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 27, 1987, Ser. No. 20,330
Claims priority, application Japan, Feb. 28, 1986, 61-43396
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—518 **2 Claims**



1. A data output control system comprising:

first storage means for storing data to be printed;

output means for printing said data on an output medium;

second storage means for storing a program including a first output-starting-position-specifying instruction having first output-line-specifying information, first output-column-specifying information and first output-mode information, a second output-starting-position-specifying instruction having second output-line-specifying information, second output-column-specifying information and second output-mode information, and a data output instruction;

third storage means for storing position information indicative of a line position and a column position on said printing medium from which the printing of said data is to be started;

first output control means for renewing said position information in said third storage means on the basis of said first output-line-specifying information and said first output-column-specifying information, and printing said data, specified by said data output instruction appearing in said program following said first output-starting-position-specifying instruction, on said printing medium from the line position and column position specified by said position information in said third storage means; and

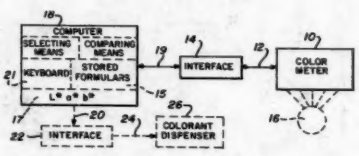
second output control means for renewing said position information in said third storage means on the basis of said second output-line-specifying information and said second output-column-specifying information after printing said data, specified by said data output instruction appearing in said program following said second output-starting-position-specifying instruction, on said printing medium from the line position and column position specified by said position information in said third storage means.

4,813,000

COMPUTERIZED COLOR MATCHING

Larry D. Wyman, Irving, and Joseph D. Webb, Garland, both of Tex., assignors to Jones-Blair Company, Dallas, Tex.

Filed Jul. 9, 1986, Ser. No. 883,593
Int. Cl.[4] G01N *21/25*; G06F *15/20*
U.S. Cl. 364—526 **12 Claims**



7. Apparatus for matching a selected color with predetermined available paint colors comprising:

a. a portable color meter for analyzing said selected color and storing chromaticity data representing the hue, chroma and brightness of said selected color,

b. a computer for storing a plurality of available paint formulas and storing chromaticity data representing the hue, chroma and brightness of each paint designated by said stored available paint formulas,

c. means for coupling said stored chromaticity data in said portable color meter to said computer,

d. means in said computer for comparing said selected color chromaticity data with said stored chromaticity data in said computer representing each paint designated by said stored available paint formulas to find the closest match, and

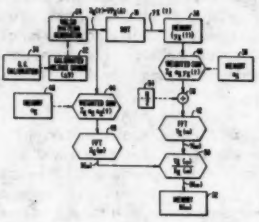
e. means for selecting the one of said stored available paint formulas represented by a said closest match chromaticity data thereby matching said selected color.

4,813,001

AC CALIBRATION METHOD AND DEVICE BY DETERMINING TRANSFER CHARACTERISTICS

Edwin A. Sloane, Los Altos, Calif., assignor to Schlumberger Systems, Inc., Sunnyvale, Calif.

Filed May 29, 1987, Ser. No. 55,670
Int. Cl.[4] G06F 11/00
U.S. Cl. 364—553 22 Claims



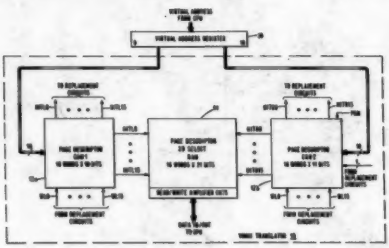
1. A method for determining a broad-band transfer function of a data acquisition system, comprising the steps of:
generating a set of bilevel signal patterns;
applying said signal patterns individually to the data acquisition system;
obtaining a response of the data acquisition system to each said signal pattern; and
computing said transfer function from said responses.

4,813,002

HIGH SPEED HIGH DENSITY DYNAMIC ADDRESS TRANSLATOR

Thomas F. Joyce, Westford; Eugene Nusinov, Sharon, and Richard P. Brown, Action, all of Mass., assignors to Honeywell Bull Inc., Waltham, Mass.

Filed Jul. 21, 1986, Ser. No. 887,768
Int. Cl.[4] G11C 15/00; G06F 12/10
U.S. Cl. 365—49 32 Claims



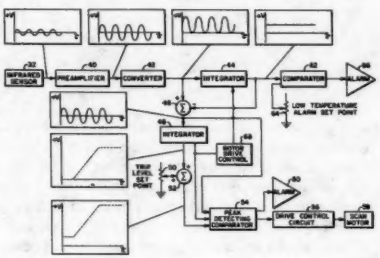
1. A translator comprising:
a plurality of content addressable memories (CAMs), each CAM for storing a different portion of each of a number of words representative of single entities to be translated and each said CAM containing a number of groups of bit cells, a number of hit lines, each of said bit cells within each said group being connected in common to a different one of said hit lines;
a random access memory (RAM) having a plurality of bit cells arranged in a number of rows, each of which stores one of a number of translated words, each of said bit cells including logic means, said logic means of each cell of each row being connected in common to said different one of said number of hit lines which connects to a corresponding group of CAM bit cells within each of said plurality of CAMs; and,
means for simultaneously applying to each of said CAMs, signals corresponding to said different portion of a word to be translated, said bit cells of each CAM comparing said different portion of said word to said number of words and generating hit signals representative of the results of said comparing on said plurality of hit lines for delivery to RAM cells within an amount of time which decreases proportionally as a function of said plurality of CAMs, said logic means of each row being conditioned by said hit signals from each of said CAMs to select as an output, a corresponding one of said translated words from said RAM only if all of said signals from said group of cells within each of said plurality of CAMs simultaneously indicate a hit condition.

4,813,003

METHOD OF DETECTING HOT SPOTS IN A ROTARY HEAT EXCHANGER

William C. Cox; Gary C. Goetschius, and Mark T. Casagrande, all of Wellsville, N.Y., assignors to Air Preheater Company, Inc., Wellsville, N.Y.

Filed Jun. 23, 1986, Ser. No. 877,034
Int. Cl.[4] G01J 5/00
U.S. Cl. 364—557 25 Claims



1. Apparatus for detecting a hot spot in a rotary regenerative heat exchanger, comprising:
a housing having an inlet and outlet ducts for a heating fluid and a fluid to be heated;
a cylindrical rotor of heat absorbent material in said housing mounted for rotation about the central axis of the rotor;
means for rotating the rotor to alternately subject the heat absorbent material thereof to the heating fluid and to the fluid to be heated;
infrared ray detecting means including a sensor confronting the heat absorbent material of the rotor for receiving infrared radiation thereon and for generating a signal proportional to the infrared radiation incident thereon that is indicative of the instantaneous rotor temperature;
means for moving the detecting means along a path in a plane parallel to and adjacent the end of the rotor;
a first circuit means for receiving the sensor signal indicative of the instantaneous temperature of the rotor, for integrating the sensor signal over a time period and for dividing the integrated result by the time period of integration to produce an average rotor temperature signal;
means for evaluating the temperature difference between the instantaneous temperature of the rotor and the average temperature of the rotor and for producing as an output the difference therebetween, the means for evaluating the difference having a first input port for receiving the instantaneous rotor temperature signal, a second input port for receiving the average rotor temperature signal and an output port at which the signal representing difference in temperature is presented;
a second circuit means for receiving the temperature difference output from the difference means and for computing

the average value of the positive portion of the temperature difference by integrating the temperature difference signal over a time period and for dividing the integrated result by the time period of integration to produce a tracking trip level signal;

summing means for adding the tracking trip level signal to a predetermined trip level set point and for producing as an output a variable trip level signal representative of a variable threshold temperature, the summing means having a first input port for receiving the tracking trip level signal, a second input port for receiving the trip level set point, and an output port at which the variable trip level signal is presented;

means for comparing the temperature difference signal output from the difference means to the variable threshold temperature, the comparing means having a first input port for receiving the temperature difference signal, a second input port for receiving the variable trip level signal and an output port at which the compared temperature signal is presented; and

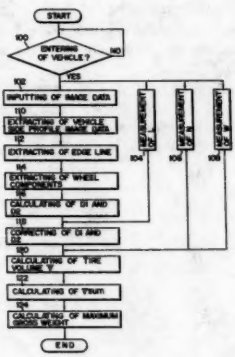
means responsive to the compared temperature signal for de-energizing the means for moving the detecting means upon the temperature difference signal exceeding the variable trip level signal.

4,813,004

METHOD FOR MEASURING THE MAXIMUM GROSS WEIGHT OF A MOTOR VEHICLE

Arisa Fujioka, Kawaguchi, and Satoshi Kageyama, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 24, 1987, Ser. No. 42,242
Claims priority, application Japan, Apr. 28, 1986, 61-98701
Int. Cl.[4] G08B *21/00*; G06K *9/00*
U.S. Cl. 364—567 **11 Claims**



1. A method for measuring a maximum gross weight of a motor vehicle having a plurality of wheels, comprising the steps of:

preparing a correlogram for finding a maximum gross weight of said motor vehicle on the basis of a volume corresponding to said plurality of wheels' wheel dimensions;

measuring a number corresponding to a quantity of said plurality of wheels, and measuring a width W and a diameter D1 for each wheel of said plurality of wheels, said measuring step including an input process for obtaining image data comprised of at least a side profile of said plurality of wheels and said measuring step including an image calculation process for calculating the diameter D1 of each wheel of said plurality of wheels on the basis of said image data;

calculating said volume corresponding to said plurality of wheels' wheel dimensions, said volume being calculated according to a predetermined formula which takes into account the quantity of said plurality of wheels and the width W and diameter D1 of each wheel of said plurality of wheels as obtained in the measuring step; and

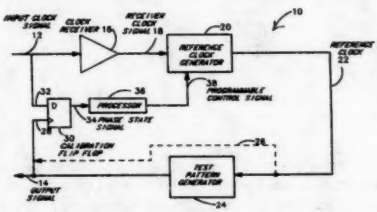
determining, from the correlogram prepared in the preparation step, the maximum gross weight of the motor vehicle on the basis of the volume as determined in the calculating step.

4,813,005

DEVICE FOR SYNCHRONIZING THE OUTPUT PULSES OF A CIRCUIT WITH AN INPUT CLOCK

Michael J. Redig, and David M. Prater, both of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 24, 1987, Ser. No. 65,971
Int. Cl.[4] G05B *19/02*; H03D *3/24*; H03L *7/00, 7/08*
U.S. Cl. 364—580 **2 Claims**



1. A device for producing a reference clock signal in a phase lock loop that synchronizes the phase of an output signal, produced by an output device in response to said reference signal, with an input clock signal produced by an external component comprising:

phase detector means for generating a difference signal proportional to the difference in phase between said input clock signal and a delayed reference clock signal produced by delaying said reference clock signal by a predetermined amount;

filter means coupled to said phase detector means for integrating said difference signal and producing a voltage signal proportional to an integrated value of said difference signal;

voltage controlled oscillator means coupled to said filter means for producing said reference clock signal having a frequency proportional to said voltage signal produced by said filter means;

programmable delay means coupled to said voltage controlled oscillator means for delaying said reference clock signal by said predetermined amount in response to a programmable delay signal to produce said delayed reference clock signal;

phase state indicator means coupled to said input clock signal and said output signal for producing a phase state signal that indicates the phase relationship of said input clock signal and said output signal;

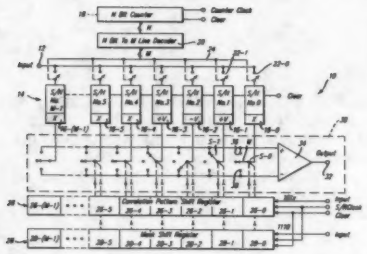
processor means for varying said programmable delay signal in response to said phase state signal to alter the phase of said reference clock signal until said phase state signal produced by said phase state indicator means changes state indicating that said input clock signal and said output signal are in-phase.

4,813,006

ANALOG-DIGITAL CORRELATOR

Richard J. Burns, Canoga Park; Kenneth R. Grim, Moorpark, and Miguel E. Levy, Camarillo, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 29, 1987, Ser. No. 67,193
Int. Cl.[4] G06J 1/00; G06F 15/336
U.S. Cl. 364—604 1 Claim



1. In a radar system wherein an analog signal having a digitally-impressed code thereon is transmitted and a cross correlator is used to determine if a received echo analog signal contains said code, the improvement comprising:

a plurality of selectively addressable sample and hold circuits;

an input line for receiving said echo analog signal;

loading means including a counter and decoder for sequentially addressing the sample and hold circuits at the same clock rate used to impress the code onto the transmitted signal whereby said sample and hold circuits store sample values of the received analog signal, the sample and hold circuits providing a positive and negative voltage level output proportional to the sampled analog signal value stored therein;

a switched capacitor network associated with each sample and hold circuit, said network including a first switch means for connecting said positive or negative voltage from the sample and hold circuit to one plate of a capacitor, the other plate of the capacitor being connected to a second switch having one pole connected to a summing node and another pole connected to ground;

a correlation pattern shift register having a plurality of stages each associated with one of the sample and hold circuits;

a mask shift register having a plurality stages each associated with one of said sample and hold circuits;

input means for loading the pattern shift register with a plurality of pattern bits;

input means for loading the mask register with a plurality of mask bits;

the state of the pattern bits controlling the first switch, with the mask bits controlling the second switch;

means for simultaneously shifting the pattern bits and mask bits through the stages of the correlation pattern shift register and mask shift register, respectively; and

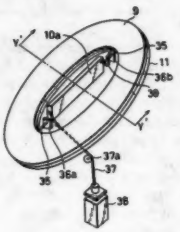
whereby the summing node provides a correlation output sum.

4,813,007

EXTERNAL MAGNETIC FIELD GENERATING DEVICE

Katsuhide Tanoshima; Yasuhiro Suzuki; Shizuo Nagata, and Yasuo Shimizu, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Feb. 8, 1988, Ser. No. 153,724
Claims priority, application Japan, Feb. 13, 1987, 62-18893[U]; Mar. 16, 1987, 62-37126[U]; May 26, 1987, 62-127182
Int. Cl.[4] G01D 15/00
U.S. Cl. 346—74.5 11 Claims



1. An external magnetic field generating device, comprising:

a magnetic plate having a face;

a pole piece connected to said face of said magnetic plate; and

a wound, electrically conductive coil having a first side, a second side, and a thickness between said first and second sides, said first side being in contact with said face of said magnetic plate, said coil being wound generally flatly surrounding said pole piece such that said coil extends in a radial direction, said coil generating a magnetic field through said pole piece when an electric current passes through said coil, said second side of said coil being spaced from said magnetic plate by said thickness of said coil;

wherein a portion of said pole piece projects beyond said second face of said coil;

whereby said pole piece can be inserted into an opening which is sufficiently small that it does not permit insertion of said coil.

4,813,008

MULTIPLIER CIRCUIT SUITABLE FOR OBTAINING A NEGATIVE PRODUCT OF A MULTIPLIER AND A MULTIPLICAND

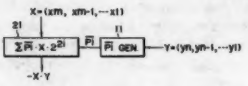
Hiroshi Shigehara, Machida; Mikio Shiraishi; Yasuhiro Watanabe, both of Yokohama, and Nobuo Sugi, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

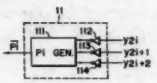
Filed Mar. 19, 1987, Ser. No. 28,183
Claims priority, application Japan, Mar. 31, 1986, 61-71179
Int. Cl.[4] G06F 7/52
U.S. Cl. 364—760 20 Claims

17. A multiplier for obtaining the negative product of data X and Y, comprising:

decoding means for receiving and decoding the multiplier Y, and producing $\overline{pi}$ (in which, it is defined that $pi=y2_{+}+y2i+1-2y2i+2$, $pi=y2i+y2i+1-2\cdot y2i+2$, $Y0=0$, and $i=0, 1, \ldots, (n-1)/2$, and yj is a jth bit of data Y); and

obtaining means for receiving said pi and the multiplicand X, and obtaining the negative product (−X·Y) of the data X





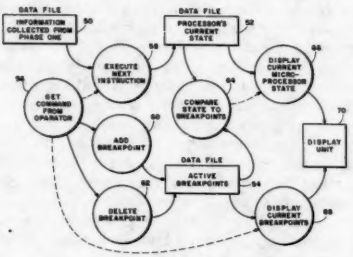
and Y in response to the $\overline{pi}$ and multiplicand X, on the basis of Booth's algorithm.

4,813,009

METHOD AND APPARATUS FOR DETERMINING INTERNAL STATUS OF A PROCESSOR

James L. Tallman, Hillsboro, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 2, 1984, Ser. No. 667,687
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—900 **10 Claims**



1. Apparatus for determining status of a processor during execution of a plurality of instructions comprising a program from infomation descriptive of the processor and externally available address, data and control signals produced by the operation of the processor during the continuous execution of the program, comprising:

first storage means coupled to the processor for storing information representative of the externally available address, data and control signals produced by the operation of the processor during the continuous execution of the program;

interface means responsive to an operator for receiving information representative of a selected status condition of the processor;

simulation means responsive to said first storage means, said interface means, and the information descriptive of the processor for producing information representative of a simulated status of the processor in response to the execution of an instruction;

second storage means responsive to the simulation means for storing information representative of the simulated status of the processor;

third storage means responsive to said interface means for storing information representative of the selected status condition of the processor;

monitoring means responsive to said second and third storage means for detecting the occurrence of information representative of a simulated status of the processor according to information representative of the selected status condition of the processor;

processor state display means responsive to said second storage means and the detection by said monitoring means for selecting information representative of the simulated status of the processor or display; and,

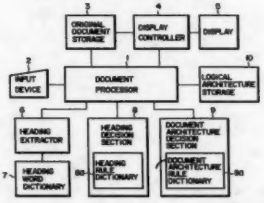
display means responsive to said processor state display means for displaying the selected information.

4,813,010

DOCUMENT PROCESSING USING HEADING RULES STORAGE AND RETRIEVAL SYSTEM FOR GENERATING DOCUMENTS WITH HIERARCHICAL LOGICAL ARCHITECTURES

Toshio Okamoto, Tokyo; Miwako Doi, and Isamu Iwai, both of Kawasaki, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 19, 1986, Ser. No. 897,930
Claims priority, application Japan, Mar. 29, 1986, 61-72121
Int. Cl.[4] G06F *3/14, 7/28, 13/00, 15/18*
U.S. Cl. 364—900 **12 Claims**



1. A document generating apparatus comprising:

means for inputting document data;

heading dictionary storing means for storing words and phrases frequently used as headings, said headings being arranged in a column direction;

heading candidate extraction means for extracting as heading candidate particular words and phrases of said words and phrases stored in said heading dictionary storing means, said heading candidate extraction means connecting to said heading dictionary storing means, said heading candidate extraction means connecting to said means for inputting document data;

heading rule dictionary means for storing rules which are used to determine said headings, said heading rule dictionary means connecting to a heading deciding means;

said heading deciding means connecting to said heading candidate extracting means, said heading deciding means being used to check said heading candidate extraction means according to said rules stored in said heading rule dictionary means, said heading deciding means deciding whether said heading candidate is a suitable heading;

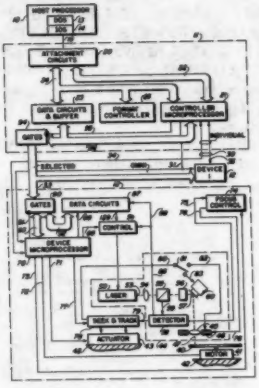
document architecture rule dictionary means for storing rules associated with document logical architecture, said document architecture rule dictionary means being connected to a document architecture deciding means; and

said document architecture deciding means being used for deciding a document logical architecture of said headings, said document architecture deciding means comparing relations between said headings and comparing a relation between said headings and at least one non-heading in accordance with said rules associated with document logical architecture stored in said document architecture rule dictionary means, said headings and said at least one non-heading being decided by said heading deciding means, said document architecture deciding mean being connected to said heading deciding means.

4,813,011
DATA PROCESSING PERIPHERAL SUBSYSTEMS HAVING A CONTROLLER AND A PLURALITY OF PERIPHERAL DEVICES

John E. Kulakowski, and Rodney J. Means, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 13, 1985, Ser. No. 733,421
Int. Cl.[4] G06F *3/06, 13/00;* G11B *21/00*
U.S. Cl. 364—900 16 Claims



1. In a data processing system having a controller and one or more peripheral devices connected to the controller;

the improvement including, in combination:

each said peripheral device having a data-handling unit for performing predetermined data processing operations and having electronic control circuits, including device-programmable means, connected to the data-handling unit for controlling the data-handling unit and for transferring data-representing signals with the data-handling unit;

the controller having electronic control circuits, including controller-programmable means, for controlling said peripheral device and for transferring said data-representing signals with said peripheral device;

connection means for coupling the electronic control circuits of said controller with the electronic control circuits of said peripheral devices for transferring said data-representing signals therebetween and for transferring control information therebetween;

a plurality of selection-connection-control means in said connection means separately and independently extending from the electronic control circuits in the controller to the respective electronic control circuits in said peripheral devices for sending a selection signal individually to but one of said peripheral devices;

data-transfer means in said connection means for transferring data-representing signals between the electronic control circuits of the controller and the electronic control circuits of said peripheral devices;

time-controlled information-transfer means in said connection means for transferring time-controlled information-representing signals between the electronic control circuits in said controller and in said peripheral devices;

device-gating means in each of said peripheral devices connected to said electronic control circuits of said each of said peripheral devices and to said time-controlled information-transfer means, to said data-transfer means and to all of said selection-connection-control means for responding to a selection signal received from a respective selection-connection-control means to pass signals between said connection means time-controlled information-transfer means and data-transfer means to and from the electronic control circuits of said each said peripheral device;

omni-connection-control means in said connection means for transferring predetermined control-information-representing signals including predetermined device commands between the electronic control circuits of any said peripheral devices and said controller independently of said selection signal;

status circuit means in said electronic control circuits of said peripheral devices connected to said omni-connection-control means for transferring status signals to the electronic control circuits of the controller independently of the selection signal and including device address information-bearing signals for indicating to the electronic control circuits of the controller the source of the status signals;

command means in the electronic control circuits of the controller connected to the omni-connection-control means for sending device commands with associated device addresses to all said peripheral devices connected to said omni-connection-control means independently of said selection signals;

status-receiving means in the electronic control circuits of said controller connected to said omni-connection-control means for receiving said status signals and having means for evaluating the received status signals;

command-executing means in the electronic control circuits of said peripheral device connected to the omni-connection-control means for receiving said predetermined device commands and associated device addresses and for responding to said device commands when the associated device address indicates the device, and connected to the data-transfer means and to said status-circuit means for activating the data-transfer means and the status-circuit means for transferring signals between the electronic control circuits in the controller and the electronic control circuits in said peripheral device;

said data-transfer means includes each of said peripheral devices data-format means for indicating predetermined data-format-reference indicia interposed between elements of data to be transferred between said electronic control circuits of said controller and the electronic control circuits of said devices which relate to a predetermined logic arrangement of the data as transferred within the respective said peripheral devices;

format-circuit means in each said peripheral device connected to said device-gating means and to said data-format means and to said selection-connection-control means for responding to the selection signal for transferring said indicated data-format-reference indicia to said controller electronic control circuits; and

write/read-circuit-control means in the controller connected to said device-gating means via said time-controlled information-transfer means for actuating same to transfer data signals between the electronic control circuits of a currently selected device and said controller electronic control circuits intermediate in time between successive ones of said indicated data-format-reference indicia.

4,813,012
TERMINAL ACCESS PROTOCOL CIRCUIT FOR OPTICAL FIBER STAR NETWORK

Marco Valeri, and Carlo A. Rocchini, both of Rome, Italy, assignors to Alcatel N. V., Stuttgart, Fed. Rep. of Germany

Filed Jul. 30, 1987, Ser. No. 80,411
Claims priority, application Italy, Jul. 30, 1986, 21310 A/86
Int. Cl.[4] G06F *13/12;* H04J *3/02*
U.S. Cl. 364—900 5 Claims

1. In each of a plurality of terminals interconnected by an optical fiber star network for serial exchanges of information among said terminals through a star center, an access protocol circuit comprising:

a random access memory for buffering received information comprising queue state data from all said terminals;

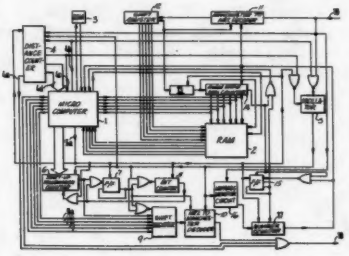
processing means responsive to the buffered queue state data for determining when said each terminal can transmit information through said star center without interfering with the transmission of information from any other of said terminals;

a read only memory for storing the physical addresses of all said terminals;

measuring means responsive to said processing means for measuring the distance from the star center to said each terminal, said measuring means comprising:

driver message means comprising an oscillator for transmitting a driver message to said star center and for receiving a corresponding echo therefrom and for generating a regular sequence of clock pulses;

means for activating said driver message means in a predetermined time sequence relative to the activation of the driver means in the other terminals of said network, in



accordance with the physical terminal addresses stored in said ROM, the driver means in the terminal nearest to the network star center being the first to be so activated;

delay counting means for counting said clock pulses from the time said driver message means is activated until the time said echo signal is received to thereby generate a delay count corresponding to the distance from the terminal to the star center, and

means for storing said delay count;

output register means for storing a queue state data word output from said processing means;

transmission delay counting means responsive to the stored delay count for generating a start-of-transmission pulse at a time when the terminal should commence transmitting information so that it will arrive at said star center at the time determined by said processing means; and

transmission means for transmitting the queue state data stored in said output register means in response to an end of count pulse from said transmission delay counting means.

4,813,013

SCHEMATIC DIAGRAM GENERATING SYSTEM USING LIBRARY OF GENERAL PURPOSE INTERACTIVELY SELECTABLE GRAPHIC PRIMITIVES TO CREATE SPECIAL APPLICATIONS ICONS

Robert M. Dunn, Woodbridge, Conn., assignor to The Cadware Group, Ltd., New Haven, Conn.

Continuation of Ser. No. 585,535, Mar. 1, 1984, Pat. No. 4,656,603. This application Dec. 22, 1986, Ser. No. 945,371

The portion of the term of this patent subsequent to Apr. 7, 2004, has been disclaimed.

Int. Cl.[4] G06F *3/153, 15/40*

U.S. Cl. 364—900 **15 Claims**

MICROFICHE APPENDIX INCLUDED

(3 Microfiche, 200 Pages)

1. A general purpose interactive rule based system for generating problem solutions in schematic diagram form comprising:

a computer processor;

a graphics terminal coupled to said processor;

means for providing a multi-portion split display on said graphics terminal;

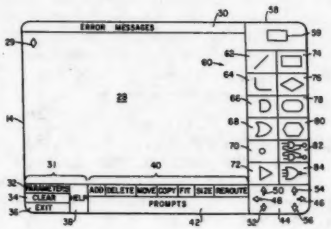
a plurality of functions and graphic primitives stored in said computer processor;

means for creating a library of icons for an intended application by enabling a methodology designer to:

select and arrange said graphic primitives using said graphics terminal,

designate more than one output for an icon to couple to more than one other icon, and

identify parameters for using each icon;



means for generating and storing a specific set of rules pertaining to the use of each icon on the basis of the parameters identified;

means for symbolically displaying in one portion of said split display a set of icons from said library;

means for displaying in another portion of said split display a set of said functions; and

means for enabling a problem solving user to access and select displayed icons and functions, and to build a solution to a problem by using functions to graphically couple icons together on a chart work area portion of said split display in accordance with said rules.

4,813,014

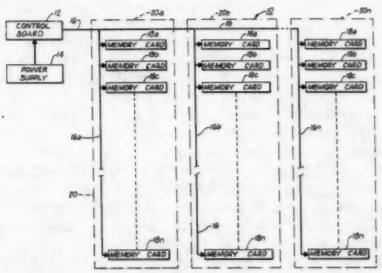
DIGITAL AUDIO MEMORY SYSTEM

Lawrence R. DeBell, Bethany, Okla., assignor to Phi Technologies, Inc., Oklahoma City, Okla.

Filed Apr. 14, 1986, Ser. No. 851,453

Int. Cl.[4] G11C *27/00, 8/00*

U.S. Cl. 365—45 **22 Claims**



1. Apparatus for storage and retrieval of audible information, comprising:

control means that includes, timing means generating a basic timing pulse at a selected frequency, counter means responsive to said timing pulses to generate a random access memory address code output, and a microprocessor receiving code input indicating information memory loca-

tion in storage and outputting at least a memory group address code output;

memory card means that includes plural memory groups of random access memory means arrayed in parallel wherein each of said memory groups consists of an equal number of said random access memory means, means connecting said random access memory address code output to control ports of each of said random access memory means, decoder means receiving said memory group address code output to enable a selected one of said plural memory groups of random access memory means, and input/output means selectively connected to respective random access memory means of a selected memory group; and

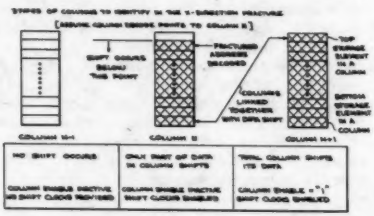
audio means including first converter means for digitizing audio for input to said input/output means for storage at a selected random access memory location, and second converter means for receiving digital data output form a selected random access memory location and outputting analog audio signal for audible output.

4,813,015

FRACTURABLE X-Y STORAGE ARRAY USING A RAM CELL WITH BIDIRECTIONAL SHIFT

Michael E. Spak, Kyle; Craig S. Tyl, and Philip C. Wottrich, both of Austin, all of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 12, 1986, Ser. No. 838,993
Int. Cl.[4] G11C *19/00, 7/00, 8/00*
U.S. Cl. 365—78 **5 Claims**



1. An x-y random access memory array for performing pushing and popping of data and for splitting the array simultaneously at a common address, comprising:

a plurality of storage elements being stacked in a plurality of rows to form an x-y organization which can be randomly accessed in response to row and column addresses;

row decoder means responsive to the row addresses for generating latched signals indicative of a selected row;

row splitting circuit means responsive to said latched signals and a control shift signal for generating decoded row select signals to access the array in the Y-direction and for generating partial shift enable signals to split the array in the Y-direction at the selected row;

column decoder means responsive to the column addresses for generating decoded column select signals to access the array in the X-direction;

column splitting circuit means responsive to said decoded column select signals for generating column shift enable signals, first clock pulses, and second clock pulses to split the array in the X-direction at the selected column in which only part of the data shifts;

shift control driver circuit means responsive to said partial shift enable signals, said column shift enable signals, said first clock pulses, and said second column pulses for generating shift pulses;

said partial shift enable signals being activated only for rows with row addresses being one of higher and lower than the selected row address;

only storage elements located in the selected column being responsive to said partial select enable signals for causing a directional shift in which one of pushing data into and popping data from at any point in the selected column is performed;

said column shift enable signals, said first clock pulses, and said second clock pulses being disabled to said storage elements located in columns with column addresses being one of lower and higher than the selected columns so as to maintain their data unchanged; and

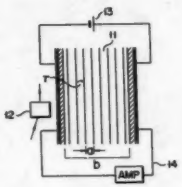
said column shift enable signals, said first clock pulses, and said second clock pulses being enabled to storage elements located in columns with column addresses being the other one of higher and lower than the selected column so as to shift their data.

4,813,016

TUNNEL MEMORY DEVICE HAVING A MULTI-LAYERED LANGMUIR-BLODGETT FILM

Takao Okada, Hachioji, and Masamichi Morimoto, Fuchu, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 29, 1986, Ser. No. 947,504
Claims priority, application Japan, Jan. 14, 1986, 61-5581
Int. Cl.[4] G11C *13/02;* **H01L** *29/28*
U.S. Cl. 365—107 **4 Claims**



1. In a three-dimensional tunnel memory device including a Langmuir-Blodgett film having opposed faces with multiple layers interposed therebetween, wherein each of said layers is adapted to store an electric charge, said layers having given tunnel barrier, molecular length and molecular mobility characteristics, means for introducing charges into one of the faces of the film in a time sequence corresponding to information to be stored, means for applying an electric field between the faces of the film to cause the charge stored by any of said layers to be transferred to an adjacent layer, and means for reading out a sequence of charges stored by the film, the improvement wherein said Langmuir-Blodgett film includes memory unit cells each comprising adjacent layers formed, respectively, of different kinds of organic compounds in contact with each other, said adjacent layers having, respectively, different tunnel barriers and one of different molecular length and molecular mobility characteristics, and wherein said means for applying an electric field applies an electric field of one magnitude to one of said layers of a selected memory unit cell and an electric field of a different magnitude to another layer of said selected memory unit cell thereby allowing the stored charge in each layer of the selected memory unit cell to hop the tunnel barrier.

4,813,017

SEMICONDUCTOR MEMORY DEVICE AND ARRAY

Robert C. Wong, Poughkeepsie, N.Y., assignor to International Business Machines Corportion, Armonk, N.Y.

Filed Oct. 28, 1985, Ser. No. 791,941
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—156 **21 Claims**

1. A semiconductor random access memory array comprising:

a plurality of memory cells which each comprise first and second transistors of one conductivity type and third and

fourth transistors of the opposite conductivity type, each transistor having an emitter, a base, and a collector;

a word line coupled to the bases of the first and second transistors;

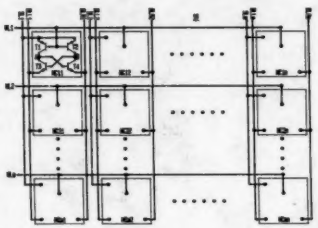
first and second bit lines coupled to the emitters of the third and fourth transistors, respectively;

a source line coupled to the emitters of the first and second transistors, respectively;

first connection means for connecting the collector of the first transistor and the base of the third transistor;

second connection means for connecting the base of the fourth transistor to the collector of the third transistor;

third connection means for connecting the collector of the second transistor and the base of the fourth transistor;



fourth connection means for connecting the base of the third transistor to the collector of the fourth transistor;

the word line and the bases of the first and second transistors are commonly provided by a first semiconductor region of the first conductivity type which exists within a semiconductor body;

the emitter of the third transistor existing within a second semiconductor region of the first conductivity type within the semiconductor body;

the emitter of the fourth transistor existing within a third semiconductor region of the first conductivity type within the semiconductor body;

the first, second, and third semiconductor regions being electrically isolated from each other.

4,813,018

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE

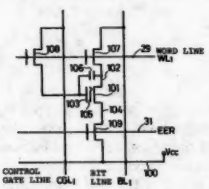
Kazuo Kobayashi; Yasushi Terada, and Takeshi Nakayama, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 25, 1987, Ser. No. 125,540

Claims priority, application Japan, Nov. 28, 1986, 61-284645

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—185 **4 Claims**



1. A nonvolatile semiconductor memory device having a plurality of memory cells (1–4) arranged in a matrix of rows and columns and each connected to a row selecting signal line (WL_1) and a bit line (BL_1) in which information can be electrically written and erased, each of said memory cells comprising

a memory transistor (101) having a first electrode (102), a second electrode (103) and a third electrode (104),

a capacitance (106) connected between the first electrode and the second electrode of said memory transistor,

a first row selecting transistor (107) connected between the first electrode of said memory transistor and said bit line,

a control gate line (CGL_1) for applying a control gate signal to the second electrode of said memory transistor, and

a second row selecting transistor (108) connected between the second electrode of said memory transistor and said control gate line,

a control transistor (109) connected to the third electrode of said memory transistor, and

means (EER) for rendering said control transistor non-conductive and rendering the third electrode of said memory transistor to be floating.

4,813,019

SEMICONDUCTOR INTEGRATED CIRCUIT

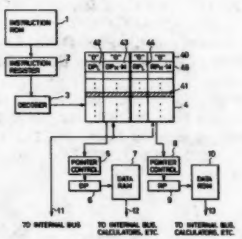
Yukihiko Shimazu, and Narumi Sakashita, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1987, Ser. No. 111,048

Claims priority, application Japan, Oct. 29, 1986, 61-259022

Int. Cl.[4] G11C *13/00*

U.S. Cl. 365—189 **3 Claims**



1. A semiconductor integrated circuit controlled by a program comprising:

an instruction register for holding an instruction of the program fetched from internal or external memory and;

a decoder for decoding said instruction in said instruction register and;

an auxiliary instruction register group having a plurality of auxiliary instruction registers of which contents can be set in advance by said program;

wherein one of said auxiliary instruction registers selected by the output of said decoder controls a portion of said semiconductor integrated circuit that is not controlled by the instruction of said instruction register or;

one of said auxiliary instruction registers selected by the output of said decoder controls a portion of said semiconductor integrated circuit while cooperating with said instruction register.

4,813,020

SEMICONDUCTOR DEVICE

Masahiro Iwamura, and Ikuro Masuda, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 825,939, Feb. 4, 1986, abandoned. This application Mar. 17, 1988, Ser. No. 170,623

Claims priority, application Japan, Feb. 7, 1985, 60-22394

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—189 **20 Claims**

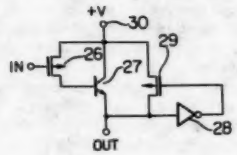
1. A semiconductor device comprising:

at least one MOS transistor;

at least one bipolar transistor adapted to be driven by said MOS transistor;

an output terminal connected to a collector or an emitter of said bipolar transistor;

logical inverter means for inverting a signal at said output terminal; and



a MOS transistor having a source and a drain thereof parallelly connected across the collector and the emitter of said bipolar transistor, adapted to be turned on and off by an output signal of said logical inverter means,

wherein said bipolar transistor is a vertical NPN transistor formed in an island on a semiconductor substrate isolated from said MOS transistors and has collector thereof isolated from said semiconductor substrate.

4,813,021

SEMICONDUCTOR MEMORY DEVICE WITH DELAYED PRECHARGE SIGNALS

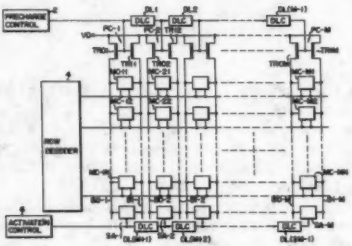
Hajime Kai, Kawasaki, and Kiyofumi Ochii, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 401,692, Jul. 26, 1982, abandoned. This application May 20, 1985, Ser. No. 735,724

Claims priority, application Japan, Jul. 27, 1981, 56-117442

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—194 **11 Claims**



1. A semiconductor memory device comprising:

a plurality of semiconductor memory cells arranged in a matrix with columns and rows;

a plurality of bit lines connected to the memory cells on the same column;

a plurality of word lines connected to the memory cells on the same row;

a row decoder circuit for selectively energizing one of said plurality of word lines;

a power source terminal;

a control signal generating circuit;

a plurality of switching circuits each connected between a corresponding one of said plurality of bit lines and said power source terminal; and

delay means for sequentially setting said switching circuits with different delay times in response to a control signal from said control signal generating circuit such that each of said delay times increases with increasing distance along said word lines between said row decoder circuit and the bit line connected to the switching circuit being set.

4,813,022

STATIC MEMORY WITH PULL-UP CIRCUIT FOR PULLING-UP A POTENTIAL ON A BIT LINE

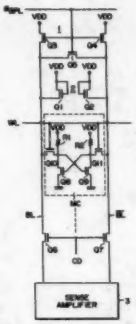
Masataka Matsui, Tokyo; Tetsuya Iizuka, Funabashi; Jun-ichi Tsujimoto, Yokohama; Takayuki Ohtani, Yokyo, and Mitsuo Isobe, Yohohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 22, 1987, Ser. No. 136,769

Claims priority, application Japan, Dec. 26, 1986, 61-315317

Int. Cl.[4] G11C *7/00, 11/34*

U.S. Cl. 365—203 **4 Claims**



1. A static memory comprising:

a static memory cell made up of a flip-flop which comprises MOS N channel transistors, and a pair of transistors as transfer gates;

pull-up means connected to a terminal for receiving a power source voltage and to a pair of bit lines, said pull-up means being made up of N channel MOS transistors for bit line pull-up; and

precharge/equalize means made up of N channel transistors, for precharging and equalizing said pair of bit lines, the threshold voltage of said N channel transistors of said precharge/equalize means being set at a value smaller than the threshold voltage of said N channel MOS transistors of said pull-up means.

4,813,023

SYSTEM EMPLOYING NEGATIVE FEEDBACK FOR DECREASING THE RESPONSE TIME OF A CELL

Michael J. Brunolli, Escondido, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Filed Oct. 21, 1986, Ser. No. 921,530

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—207 **19 Claims**

1. In combination,

a first line,

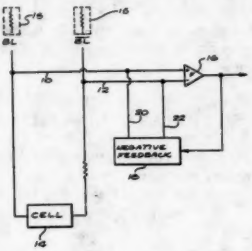
a second line,

means for providing a first binary input signal having first and second logic levels and a second binary input signal having one of the second and first logic levels at the same time as the occurrence of the other one of the first and second logic levels of the first binary input signal, the first and second binary input signals coding for a binary bit on a complementary basis,

means for introducing the first binary input signal to the first line,

means for introducing the second binary input signal to the second line at the same time as the introduction of the first binary signal to the first line,

means for amplifying and inverting the difference in the logic levels of the first and second input signals, and



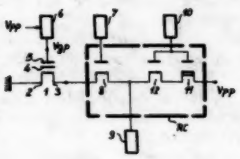
means responsive to the output from the amplifier means for feeding such output back to an individual one of the first and second lines to decrease the difference in the logic levels of the first and second lines.

4,813,024

INTEGRATED CIRCUIT FOR THE CONFIDENTIAL STORAGE AND PROCESSING OF DATA, COMPRISING A DEVICE AGAINST FRAUDULENT USE

Gilles Lisimaque, and Serge Fruhauf, both of Peynier, France, assignors to Thomson Composants Militaires Et Spaciaux, Paris, France

Filed Jun. 10, 1987, Ser. No. 62,078
Claims priority, application France, Jun. 13, 1986, 86 08589
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—228 **3 Claims**



1. An integrated circiut for the confidential storage and processing of data, comprising:

an electrically programmable non-volatile memory contianing, at least authorization data,

input/output means used to couple said circuit to eternal circuitry,

processing means connected getween the input/output means and the non-volatile memory, said processing means comprising a comparator for comparing the authorization data with a confidential code on an accesskey introduced through the input/output means, means for writing in a non-volatile memory zone an error bit whenever the comparator indicates that the confidential code or accesskey is wrong,

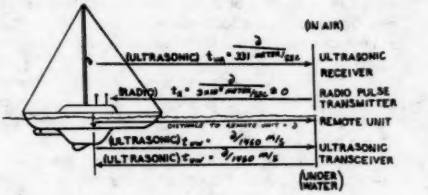
said integrated circuit further comprising a simulation cell circuit, which is activated when the comparator indicates that the confidential code or access key is right and which then, without memorizing any information, draws an electrical current substantially identical to the current drawn by the writing of an error bit in said non-volatile memory zone.

4,813,025

SAFETY ALERT AND LOCATING SYSTEM

David B. Rowland, 1200 J Court Drive, Duluth, Ga. 30136, and William W. Smith, Jr., Goldsboro, N.C., assignors to David B. Rowland, Dulnth, Ga.

Filed Jun. 12, 1987, Ser. No. 60,863
Int. Cl.[4] H04B *1/59*; G01S *3/80*
U.S. Cl. 367—6 **11 Claims**



1. A safety alert and locating system comprising,

means for transmitting first and second coded interrogation signals from a central location, each of said first and second interrogation signals containing at least one address code, said first signal being transmitted through a first transmission medium and said second signal being transmitted through a second, different transmission medium,

one or more individual means adapted to receive said coded signals, each of said individual means being located at a distance from and at an angle to said central location and being responsive to its own address code contained in said first and second signals,

each of said individual means being adapted to transmit a response signal upon receipt of at least one of said first and second signals addressed to it, the response signal being transmitted through the transmission medium through which the signal was received,

means at said central location for receiving the signal transmitted by said individual means, and

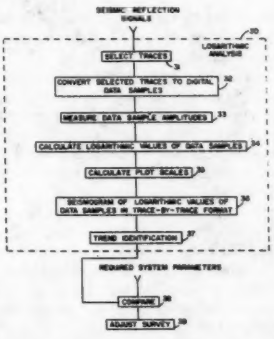
location determining means at the central location for determining from the received signal the distance and angle of said individual means relative to said central location.

4,813,026

METHOD FOR LOGARITHMIC ANALYSIS OF SEISMIC REFLECTION SIGNALS

Carl A. Quaglino, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 27, 1987, Ser. No. 125,902
Int. Cl.[4] G01V *1/24*
U.S. Cl. 367—29 **2 Claims**



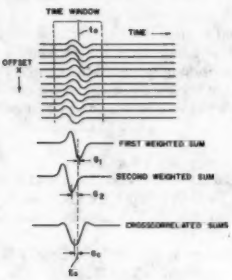
1. A method of conducting a seismic survey along a line of exploration, comprising the steps of:

(a) traversing a line of exploration with a seismic survey system having an acoustic energy source, an array of spaced-apart receivers, and a recording system,
(b) firing said acoustic energy source at a plurality of shot points along said line of exploration,
(c) recording seismic reflection signals received by said array of receivers for each of said shot points,
(d) digitizing said recorded seismic reflection signals to provide a plurality of digital data samples for each of said recorded seismic reflection signals,
(e) determining the logarithmic value for each of said digital data samples,
(f) plotting the logarithmic values of said digital data samples to provide a seismogram with the seismic reflection signals from said receivers being recorded in side-by-side trace relationship,
(g) comparing the logarithmically plotted traces of said digital data samples to detect a trend in one or more select seismic survey parameters along said line of exploration away from a required value for said select seismic parameter, and
(h) adjusting said select parameter to bring the value of said select parameter for which said trend is detected back in line with the required value for said select parameter.

4,813,027
METHOD AND APPARATUS FOR ENHANCING SEISMIC DATA

Hans Tieman, Dhahran, Saudi Arabia, assignor to Arabian American Oil Company, Dhahran, Saudi Arabia

Filed Jul. 17, 1987, Ser. No. 74,698
Int. Cl.[4] G01V *1/36*
U.S. Cl. 367—52 **34 Claims**

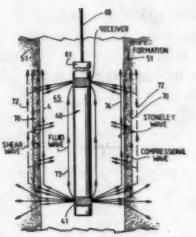


1. A method for stacking a plurality of seismic midpoint gathers to provide an enhanced pictorial representation of seismic events, comprising:
(a) providing a plurality of common midpoint gathers;
(b) estimating the propagation velocities corresponding to selected events associated with the common midpoint gathers;
(c) stacking the common midpoint gathers using the corresponding velocity estimates, to produce corresponding midpoint stacks;
(d) estimating the zero offset travel times associated with selected events in the midpoint stacks;
(e) summing the common midpoint gathers using first and second weights to provide respective first and second weighted sums over offset for each selected event, over a time window centered upon the associated estimate of zero offset travel time, and based upon the estimated propagation velocity for that event;
(f) approximating the error in the estimated propagation velocity, as a function of the first and second weighted sums, to thereby obtain an updated estimate of the propagation velocity for each selected event; and
(g) re-stacking the common midpoint gathers in accordance with the propagation velocity as determined for each associated event in step (f) above, to thereby provide an enhanced pictorial representation of the seismic events.

4,813,028
ACOUSTIC WELL LOGGING METHOD AND APPARATUS

Olive Y. Liu, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Jul. 7, 1987, Ser. No. 70,470
Int. Cl.[4] G01V *1/40*
U.S. Cl. 367—31 **13 Claims**



1. A method for determining the permeability of a subsurface geological formation traversed by a borehole, comprising the steps of:
(a) passing a logging tool through the borehole, the logging tool including a rare earth acoustic transducer;
(b) generating low frequency acoustic energy at a point in the borehole using the rare earth acoustic transducer;
(c) receiving acoustic signals at a plurality of receiver stations spaced one from the other and from the rare earth acoustic transducer;
(d) producing full waveforms of the received signals including shear waves and Stoneley waves for the point in the borehole;
(e) measuring values of the attenuation of the Stoneley wave and values of the velocity of the shear wave for the point in the borehole; and
(f) combining the measured values of the Stoneley wave attenuation and the shear wave velocity with other known measured values of borehole characteristics to obtain the permeability of the formation at the point in the borehole.

4,813,029
GEOPHONE APPARATUS AND A SEISMIC EXPLORATION METHOD

Otis G. Erich, Jr., La Mirada, and Walter R. Fillippone, Placentia, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

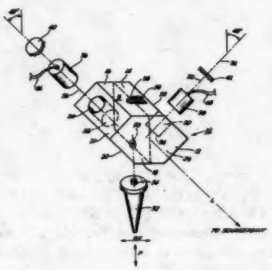
Filed Aug. 5, 1981, Ser. No. 290,413
Int. Cl.[4] G01V *1/18*
U.S. Cl. 367—188 **19 Claims**

19. A seismic exploration method for concurrently obtaining both compressional and horizontal shear wave profiles of subterranean strata underlying the earth surface between a sourcepoint and a receiver location, which method comprises:
(a) coupling to the earth at said receiver location a geophone apparatus having first and second geophones mounted on a common baseplate such that the axes of said geophones are inclined in opposite directions at an angle of about 45° from vertical, said apparatus being aligned such that a line from said sourcepoint to said receiver location is substan-

tially normal to a vertical plane or planes containing said axes;

(b) transmitting a seismic signal having both compressional and horizontal shear wave components from said sourcepoint into said subterranean strata;

(c) employing said geophone apparatus to sense the seismic energy returning from said subterranean strata to said receiver location and causing said first and second geophones to generate first and second output signals, respectively, each of which is proportional to the seismic energy sensed by the respective geophone;



(d) summing said first and second output signals to form a first raw trace upon which the compressional wave components of said returning seismic energy are accentuated and the horizontal shear wave components are attenuated; and

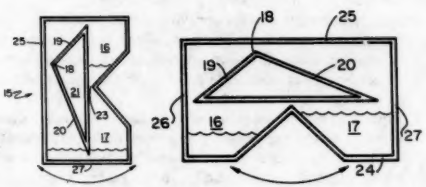
(e) subtracting said first output signal from said second output signal to form a second raw trace upon which the horizontal shear wave components of said returning seismic energy are accentuated and the compressional wave components are attenuated.

4,813,030

RESETTABLE MULTIPLE TIMER

Oliver F. Johnson, Arcata, Calif., assignor to Kurt Jensen, Sacramento, Calif.

Filed Jul. 23, 1987, Ser. No. 76,899
Int. Cl.[4] G04F 1/04
U.S. Cl. 368—93 **7 Claims**



1. A resettable multiple timing device, comprising:

a transparent housing, said housing adapted to be sealed so as to provide a closed system;

a quantity of timing medium;

a pair of baffles, adapted to divide said timing medium into unequal measured portions when said timing device is properly rotated;

a restricted flow timing orifice, said orifice adapted to meter the flow of said timing medium therethrough; and

a plurality of reservoir areas, connected to said baffles, each of said reservoir areas adapted to allow at least a portion of said timing medium to be collected therein; and

wherein substantially all of said quantity of medium may be brought together instantly in one of said reservoirs for future separative use, and wherein a 180° revolution of the timing device will cause said timing medium to be separated into first and second unequal quantities; and

wherein said first quantity of timing medium flows into a first reservoir, and said second quantity of timing medium flows into a second reservoir, said first and second reservoirs being divided by said restricted flow orifice; and

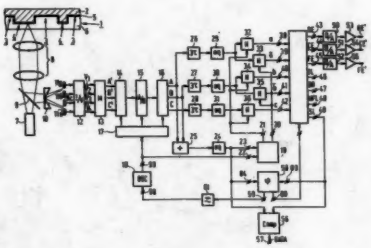
wherein said first and second quantities of the timing medium are adapted to provide a choice between first and second time intervals, respectively.

4,813,031

APPARATUS FOR REPRODUCING INFORMATION FROM AN OPTICALLY READABLE RECORD CARRIER

Martinus P. M. Bierhoff, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Mar. 14, 1984, Ser. No. 589,386
Claims priority, application Netherlands, Oct. 17, 1983, 8303564
The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.
Int. Cl.[4] O11B 7/00
U.S. Cl. 369—45 **9 Claims**



1. An improved apparatus for reproducing information from an optically readable record carrier on which digital information is stored in the form of a track of optically detectable areas which alternate with intermediate areas, each such area representing data bits occurring at a predetermined bit frequency, which apparatus comprises:

an optical system for projecting a light beam which produces a spot of light on the record carrier and which is reflected therefrom;

at least two optical detectors which are so arranged in the beam of light reflected from the record carrier that in the case of correct tracking the two detectors are disposed symmetrically with respect to the reflected image of the track and thereby detect equal amounts of the reflected light;

a signal-generating circuit for generating at least a first and a second detection signal respectively representative of the amounts of light detected by the two optical detectors; and

a control-signal generator for generating from said detection signals at least one control signal which is a measure of the position relative to said track of the spot of light produced thereon by said light beam; said improvement being characterized in that said control-signal generator comprises:

oscillator means for supplying a clock signal;

an analog-to-digital converter which is clocked by the clock signal and samples the detection signals in synchronism therewith during scanning of optically detectable areas of said track and during scanning of intermediate areas of said track;

detection means coupled to said analog-to-digital converter for identifying the sampled detection signals which originate from optically detectable areas of said track and the

sampled detection signals which originate from intermediate areas of said track; and

signal-separating means coupled to said detection means for separating the sampled detection signals originating from optically detectable areas of said track from those originating from intermediate areas of said track.

4,813,032

MAGNETO-OPTICAL INFORMATION REPRODUCING APPARATUS IN WHICH THE AZIMUTH ANGLE OF THE TRANSMISSION AXIS OF AN ANALYZER IS OPTIMIZED SO THAT THE C/N RATIO OF A REPRODUCING SIGNAL IS MAXIMUM

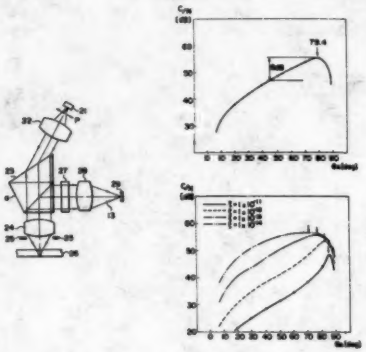
Osamu Koyama, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 13, 1987, Ser. No. 106,787

Claims priority, application Japan, Oct. 17, 1986, 61-246616; Oct. 17, 1986, 61-246618

Int. Cl.[4] G11B *11/14, 5/127, 13/04*

U.S. Cl. 369—13 **10 Claims**



1. A magneto-optical information reproducing apparatus comprising means for applying a light beam polarized in a predetermined direction onto a recording medium on which information is magnetically recorded, analyzer means for analyzing the reflected or transmitted light beam from said recording medium modulated into a polarized state in conformity with said information by the magneto-optical effect, a photodetector having no amplifying action and photoelectrically detecting the light beam transmitted through said analyzer means, and amplifying means for amplifying the detection signal of said photodetector and reproducing said information, characterized in that the single θA formed between the optic axis of said analyzer means and said predetermined direction satisfies the following conditions:

$$\sin^2\theta_A \sim$$

$$\frac{F_R + S + T}{(1-\eta_A)((1+\eta_A)F_R + S)}\left\{1 - \sqrt{\frac{(\eta_A)^2 F_R + \eta_A S + T}{F_R + S + T}}\right\}$$

$$F_R = \xi \cdot (\kappa\epsilon|t_A|^2 |R|^2 I_O)^2 \cdot \Delta B$$

$$S = 2\kappa\epsilon|t_A|^2 |R|^2 I_O \cdot \Delta B$$

where the average of the intensities of polarized components entering said photodetector and not modulated by the magneto-optical effect is I_r, the square mean of the intensity fluctuation in a magneto-optical signal observation frequency is I_r^2, $\xi = \Delta I_r^2 / I_r^2$, the quantity of light of the incident light beam on said recording medium is I_O, the amplitude reflectance of said recording medium is R, the light utilization efficiency of the optical system from the recording medium to be photodetector except said analyzer means is ϵ, the photo-electric conversion efficiency of said photodetector is k, the amount of charge is e, the thermal noise of said amplifying means in the magneto-optical signal observation frequency is T, the band width of the detection singal is ΔB, the amplitude transmittance of said analyzer means is tA, and the extinction ratio of said analyzer means is ηA.

4,813,033

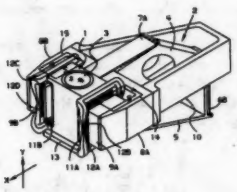
TWO AXIS ELECTROMAGNETIC ACTUATOR WITH AXIS BALANCED SUSPENSION

Holger J. Baasch, Rochester, and Francis S. Luecke, Byron, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1985, Ser. No. 793,050

Int. Cl.[4] G11B *7/09*; G02B *7/02*

U.S. Cl. 369—45 **12 Claims**



1. An actuator for displacing an element for deflecting and/or focusing a beam of radiation impinging on a storage medium in a data storage system comprising:

a movable carrier for carrying said element;

electro-magnetic means for applying forces on said carrier to move said carrier in a direction, which is the vector sum of motion along first and second orthogonal axes, said forces being substantially centered on the center of mass of said carrier;

a suspension mount assembly with its center of mass located along said first axis which also passes through the center of mass of said carrier, said assembly having two sets of paired suspension mounting locations, said mounting locations in each pair being offset an equal distance and in opposite directions from the center of mass of said mount assembly;

first springs parallel with said first axis and connected between one set of paired mounting locations on said suspension assembly and said movable carrier to permit movement of said carrier along said second axis substantially orthogonal to said first axis;

second springs parallel to said second axis and connected between the other set of paired mounting locations on said suspension assembly and a base member to permit movement of said carrier along said first axis;

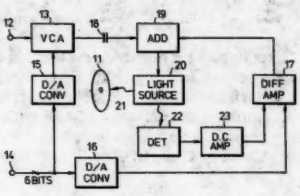
said mount assembly being skewed to at least one of said axes so that said second springs will not interfere with said first springs.

4,813,034

OPTICAL DISC RECORDING APPARATUS WITH A LIGHT BEAM HAVING A CONTROLLABLE QUANTITY

Akira Mashimo, Tokorozawa, Japan, assignor to Teac Corporation, Japan

Filed Apr. 8, 1987, Ser. No. 35,760
Claims priority, application Japan, Apr. 14, 1986, 61-84348
Int. Cl.[4] G11B 7/00; H01S 3/13
U.S. Cl. 369—116 5 Claims



1. An optical disc recording apparatus for recording an information signal on an optical disc by use of a recording light beam, said optical disc recording apparatus comprising:

a light generating source for generating a recording light beam;

a first input terminal supplied with an angular modulated information signal;

a second input terminal supplied with a power setting signal indicative of a radial position of the recording light beam on the optical disc;

open loop circuit means for controlling an amplitude of the angular modulated information signal responsive to the power setting signal;

detecting means for detecting a quantity of light of the recording light beam and for producing a direct current signal within an output detection signal which is obtained by subjecting the detected quantity of light to a photoelectric conversion, said detecting means comprising a light detecting element for detecting the quantity of light of the recording light beam and for producing the detection signal, and direct current amplifier for passing only a direct current component and a low frequency component of the detection signal from said light detecting element;

level control means for variably controlling a level of the direct current signal from said detecting means depending on the radial position of the recording light beam on the optical disc and according to a preset characteristic, said level control means comprising a differential amplifier for supplying to said adding means a signal having a level dependent on a level difference between the direct current signal from said second input terminal; and

adding means for adding an output direct current signal level of aid level control means and an output signal of said open loop circuit means and for supplying an added signal to said light generating source so as to control a quantity of light of the recording light beam generated thereby,

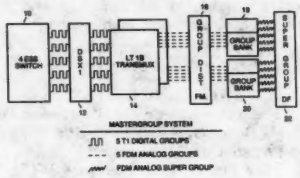
said direct current signal from said detecting means being controlled by a closed loop circuit means comprising said detecting means, said level control means and said adding means.

4,813,035

TRANSMULTIPLEXER VIRTUAL GROUP DISTRIBUTION FRAME

H. John Bishop, Milpitas; Morley M. Merriss, Montara; Thomas L. Ohlsson, Sunny Vale, and Terrence G. Sopira, Mountain View, all of Calif., assignors to Granger Associates, Santa Clara, Calif.

Filed Nov. 4, 1986, Ser. No. 926,973
Int. Cl.[4] H04J 4/00
U.S. Cl. 370—50 4 Claims



1. A transmultiplexer comprising

means connected between digital facilities and analog facilities for translating information between time division multiplex (TDM) and frequency division multiplexed (FDM) formats on said digital and analog facilities, respectively, wherein information in said TDM format is connected via a plurality of multichannel T-1 type lines and wherein information in said FDM format is connected via a plurality of multichannel supergroups, and

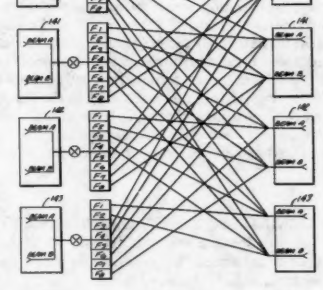
hand held type programmable control means for controlling the switching of information between said TDM and FDM formats, said programmable control means including means for controlling the switching of information between any one channel group to any other channel group.

4,813,036

FULLY INTERCONNECTED SPOT BEAM SATELLITE COMMUNICATION SYSTEM

Clay T. Whitehead, McLean, Va., assignor to National Exchange, Inc., McLean, Va.

Filed Nov. 27, 1985, Ser. No. 802,990
Int. Cl.[4] H04Q 11/02
U.S. Cl. 370—57 6 Claims



1. A communication system for providing communication routes between a plurality of communication points, comprising

frequency-selective routing array means having a plurality

of electronic paths wherein each electronic path is distinct from each other electronic path and said frequency-selective routing array means is adapted to receive electronic signals and transmit electronic signals and is adapted to be located within an airborne satellite, and

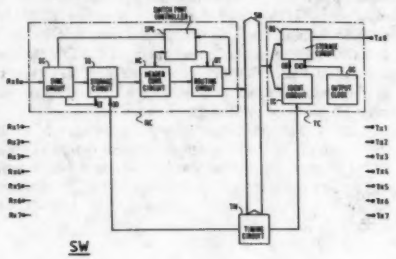
network control means located on the ground and physically apart form said frequency-selective routing array means and adapted to communicate with said communication points and adapted to select carrier frequencies for communications between said communication points and through said frequency-selective routing array means and wherein the frequency of said selected carrier frequencies determines which electronic path is used.

4,813,037

SWITCHING SYSTEM

Pierre L. Debuysscher, Nazareth; Jan G. Bauwens, Wilrijk, and Michel P. M. DeSomer, Aalst, all of Belgium, assignors to Alcatel NV, Amsterdam, Netherlands

Filed Jan. 15, 1987, Ser. No. 4,367
Claims priority, application Belgium, Jan. 24, 1986, 904100
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—60 **17 Claims**



1. Switching system (SW) for switching digital signals applied to any one of a plurality of input terminals (R×0 to R×7) thereof to any one of a plurality of output terminals (T×0 to T×7) thereof, said switching system including common switching means (SB, TM), a plurality of input means (RC) each coupling one of said input terminals to said common switching means, and a plurality of output means (TC) each coupling said common switching means to one of said output terminals, characterized in that said signals are in packets the form of having a header containing routing information and in that each of said input means (RC) includes processor means (SPC) coupled to routing means (RT) also included in said input means, said routing means being coupled between said one of said input terminals (R×0 to R×7) and said common switching means (SB, TM) and being able to route said packets to said processor means or, through said common switching means, to one of said output terminals (T×0 to T×7) according to said routing information contained in the header of the packet, said processor means being able to indicate said one of said output terminals to said routing means in response to packets received by said processor means.

4,813,038

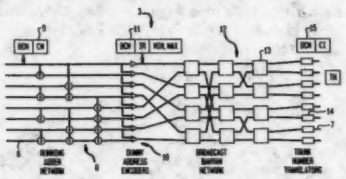
NON-BLOCKING COPY NETWORK FOR MULTICAST PACKET SWITCHING

Tony T. Lee, Bridgewater, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Jun. 29, 1987, Ser. No. 68,197
Int. Cl.[4] H04J *3/26*
U.S. Cl. 370—60 **35 Claims**

33. A method for routing a data packet through a node in the k^{th} stage of a network comprising an array of interconnected nodes organized into N stages, said nodes having logic "0" and logic "1" outputs, said packet having a header including a minimum binary number $m_1 \ldots m_N$ and a maximum binary number $M_1 \ldots M_N$ which together define an interval, said method comprising the steps of:

if $m_k = M_k$, transmitting said packet out said logic "0" or said



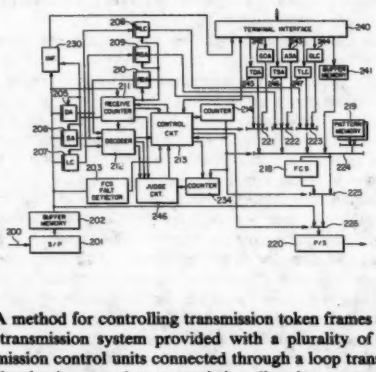
logic "1" output and if $m_k = M_k$, transmitting a first copy of said packet out said logic "0" output with a header including the interval $[m_1 \ldots M_N M_1 \ldots M_{k-1}011 \ldots 1]$ and transmitting a second copy of said packet out said logic "1" output with a header including the interval $[m_1 \ldots m_{k-1}10 \ldots 0, M_1 \ldots M_N]$.

4,813,039

LOOP TRANSMISSION SYSTEM AND DATA TRANSMISSION CONTROL METHOD

Takiyasu Yoshihiro, Higashimurayama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 6, 1987, Ser. No. 117,853
Claims priority, application Japan, Nov. 7, 1986, 61-263738
Int. Cl.[4] H04J *3/16*
U.S. Cl. 370—89 **4 Claims**



1. A method for controlling transmission token frames for a loop transmission system provided with a plurality of data transmission control units connected through a loop transmission line having one data transmission direction, comprising the following steps of:

by means of one of said data transmission control units, sending out a token frame to said loop transmission line, said token frame including the address assigned to said unit in the source address field of said token frame;

when no data transmission request is issued, relaying a token frame received by each of the data transmission control units from upstream of the transmission line to downstream of the transmission line;

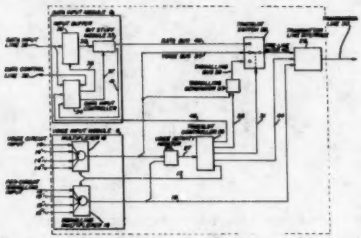
when the data transmission control unit which sent out said token frame receives said previously transmitted token frame, determining whether the reception has occurred within a predetermined time after said token frame was sent out; and

if said reception has occurred within said predetermined time, resending the token frame including its assigned address in said source address field of said token field.

4,813,040
METHOD AND APPARATUS FOR TRANSMITTING DIGITAL DATA AND REAL-TIME DIGITALIZED VOICE INFORMATION OVER A COMMUNICATIONS CHANNEL

Steven P. Futato, 4016 Poplar St., Fairfax, Va. 22030

Filed Oct. 31, 1986, Ser. No. 925,172
Int. Cl.[4] H04J 3/17
U.S. Cl. 370—111 13 Claims



1. A method of transmitting digitalized voice and data over a communications channel as a combined data stream, said digitalized voice being formed by digitalizing a voice signal using an encoding protocol wherein various amplitude levels of said voice signal are each represented as an individual bit code, at least a first amplitude level being represented by at least first and second redundant said bit codes, said digitalized voice being transmitted over said communications channel in substantially real time, comprising:

substituting said second redundant bit code for said first redundant bit code when said first redundant code is detected in said digitalized voice;

monitoring said voice signal to detect the absence of any substantial voice communication;

inserting said first redundant code in said data stream to signal the beginning of data transmission when no substantial voice communication is detected by said step of monitoring;

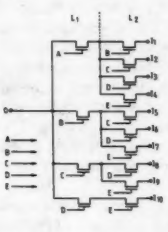
inserting data into said combined data stream for a period of time after said first redundant code; and

transmitting said data stream including said digitalized data over said communications channel.

4,813,041
VERY LOW POWER ANALOG MULTIPLEXERS

Leonardo M. Reyneri, Noordwijk, Netherlands, assignor to Agence Spatiale Europeenne, Paris Cedex, France

Filed Sep. 28, 1987, Ser. No. 101,404
Claims priority, application France, Oct. 9, 1986, 86 14053
Int. Cl.[4] H04J 3/04
U.S. Cl. 370—112 2 Claims



1. An analog multiplexer with N variables having a configuration defined by:

a number of controlled switches in series per channel, namely per input parameter which is equal to K, K being defined by the ratio N/2 or the ratio (N−1)/2 depending on whether N is even or uneven, respectively, and

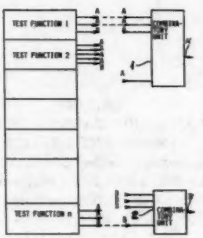
a number of input parameters equal to the number of combinations.

$$\binom{N}{K}.$$

4,813,042
PROCESS FOR MONITORING A DATA PROCESSING UNIT AND A SYSTEM FOR PERFORMING THE PROCESS

Jens Maaløe, Vaerløse; Rudolf Budinka, Lyngby, and Svend V. Andersen, Hillerod, all of Denmark, assignors to Aktieselskabet Nordiske Kabel-OG Traadfabriker, Frederiksberg, Denmark

PCT No. PCT/DK86/00043, § 371 Date Feb. 9, 1987, § 102(e) Date Feb. 9, 1987, PCT Pub. No. WO86/06520, PCT Pub. Date Nov. 6, 1986
PCT Filed Apr. 28, 1986, Ser. No. 12,058
Claims priority, application Denmark, Apr. 29, 1985, 1907/85
Int. Cl.[4] G06F 11/22, 11/30
U.S. Cl. 371—16 10 Claims



1. A process for monitoring a data processing unit, comprising: producing a first type of information and a second type of information in a data processing unit, for a test thereof; updating a sequence network external to the data processing unit with the first type of information a plurality of times to provide a third type of information, and comparing the third type of information and other, predetermined information in response to the second type of information for monitoring the data processing unit.

4,813,043
SEMICONDUCTOR TEST DEVICE

Hideshi Maeno, and Tetsuo Tada, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

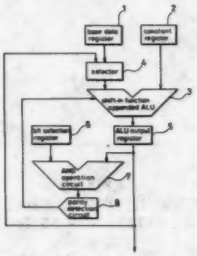
Filed Feb. 20, 1987, Ser. No. 17,079
Claims priority, application Japan, Feb. 21, 1986, 61-37745
Int. Cl.[4] G01R 31/28
U.S. Cl. 371—27 3 Claims

1. A test device for generating algorithmic test patterns comprising:

an ALU unit with shift-in means for generating and storing algorithmic test patterns by conducting predetermined arithmetic and logic operations on input data to said ALU unit;

parity detection means for generating a parity detection bit from selected parity bits of said algorithmic test patterns generated by said ALU unit, said parity detection bit is

input into said ALU unit for providing said shift-in means; and



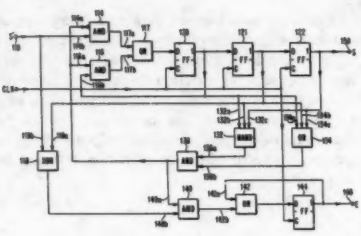
selection means for selecting between input reference data and said algorithmic test patterns from said ALU unit, said selecting means provides said input data to said ALU unit.

4,813,044

METHOD AND APPARATUS FOR DETECTING TRANSIENT ERRORS

Manoj Kumar, Crompond; Ambuj Goyal, Amawalk, and Bharat D. Rathi, Mahopac, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 30, 1987, Ser. No. 9,166
Int. Cl.[4] H03K *13/32*
U.S. Cl. 371—55 **9 Claims**



1. A method for detecting transient errors on a line between a receiver and a transmitter comprising the steps of:

providing an input signal to said transmitter;

generating an output signal at said transmitter having a predetermined number of output transitions in signal level for every input transition in said output signal and providing said output signal to said line;

detecting said output transitions received on said line at said receiver;

generating a single transition at said receiver upon the reception of said predetermined number of transitions at said receiver; and

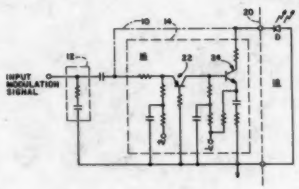
detecting an error and providing a signal indicative thereof upon receipt of less than and more than said predetermined number of transitions.

4,813,045

LASER DRIVER

Charles F. Culpepper, Ithaca, N.Y., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 28, 1986, Ser. No. 889,993
Int. Cl.[4] H01S *3/00, 3/10*
U.S. Cl. 372—38 **3 Claims**



1. A laser driver for a laser diode comprising:

an impedance matched input buffer amplifier to which a modulation signal is applied; and

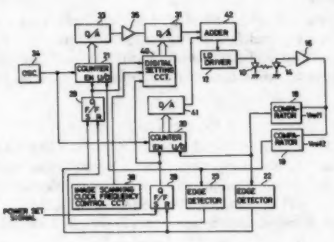
a current source coupled to the output of the impedance matched input buffer amplifier, the output of the current source providing an essentially constant amplitude a.c. current component coupled to drive the laser diode.

4,813,046

OPTICAL SCANNING METHOD

Kazuyuki Shimada, Chofu, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 18, 1987, Ser. No. 98,603
Claims priority, application Japan, Sep. 19, 1986, 61-221507
Int. Cl.[4] H01S *3/00*
U.S. Cl. 372—38 **3 Claims**



3. A laser beam image writing system comprising:

a surface, a laser which generates a laser beam for writing along scan lines at said surface, wherein said laser beam can be modulated with image information, and a deflector for scanning said light beam along said surface such that the beam speed along a scan line is high at the ends but low at the center of a scan line;

a clock circuit generating writing clock intervals at a clock rate which varies with the speed of the light beam along a scan line; and

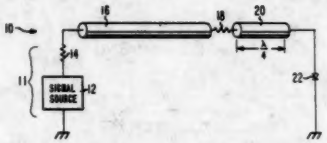
an intensity control circuit which controls the intensity of said laser beam as a function of both the speed of said light beam along a scan line and the intensity of said light beam at points at the ends and at the center of a scan line to reduce variations between the intensity of said light beam as between said writing clock intervals when said beam is not modulated by image information.

4,813,047

HIGH FREQUENCY SIGNAL DRIVER FOR A LASER DIODE AND METHOD OF FORMING SAME

Minoru Toda, Lawrence Township, Lawrence County, N.J., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 5, 1987, Ser. No. 104,615
Int. Cl.[4] H01P 5/00
U.S. Cl. 372—38 15 Claims



1. A signal processing apparatus coupled to a component for applying a voltage across said component, said component having an impedance and whose output decreases when the frequency of an input signal increases past a first frequency, said apparatus comprising:

signal means for providing a signal having a range of frequencies;

a source transmission line having a characteristic impedance and being coupled to said signal means, and a coupling impedance coupled to said source transmission line, said signal means, said source transmission line and said coupling impedance defining a source impedance; and

a component transmission line coupled between said coupling impedance and said component, said component transmission line being resonant at a second frequency which is greater than said first frequency, and having a characteristic impedance and an input impedance, said source impedance being different than said input impedance and said characteristic impedance of said component transmission line, and said source impedance being greater than the impedance of said component;

wherein said coupling impedance is of a value such that the voltage across the component at direct current is about equal to the voltage across the component at said second frequency.

2. The apparatus of claim 1 wherein said component comprises a semiconductor laser diode.

4,813,048

SEMICONDUCTOR LASER DRIVING DEVICE

Kazuo Yamane; Masakazu Mori, both of Kawasaki; Takashi Tsuda, Tokyo; Yoshinori Ohkuma, and Kazuhiro Suzuki, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 921,110, Oct. 21, 1986. This application May 23, 1988, Ser. No. 197,214
Claims priority, application Japan, Oct. 22, 1985, 60-234634; Mar. 19, 1986, 61-059464
Int. Cl.[4] H01S 3/00
U.S. Cl. 372—38 6 Claims

1. A semiconductor laser driving device comprising:

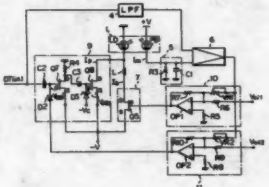
a semiconductor laser;

a bias current supply circuit, connected to said semiconductor laser, for supplying a bias current to said semiconductor laser, said bias current supply circuit including one or more FETs used as an active element;

a pulse amplifier including one or more FETs, for varying an input pulse to supply a pulse current for causing an emission of light by the semiconductor laser in response to an input pulse signal;

a power control circuit for controlling a bias current of said bias current supply circuit and a pulse current of said pulse amplifier to maintain a power of said light output from said semiconductor laser at a constant value in response to a monitoring light emitted from said semiconductor laser;

a first compensating circuit, connected to said power control circuit, for compensating a control signal output from said power control circuit so as to be adapted to a given operating characteristic of said bias current supply circuit; and



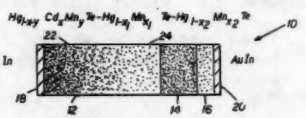
a second compensating circuit, connected to said power control circuit, for compensating the control signal output from said power control circuit so as to be adapted to a given operating characteristic of said pulse amplifier.

4,813,049

SEMIMAGNETIC SEMICONDUCTOR LASER

Piotr Becla, Arlington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sep. 23, 1987, Ser. No. 100,119
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—44 11 Claims



1. Semimagnetic semiconductor laser heterostructure comprising:

a substrate region of magnetic element alloyed Group II-VI elements doped with a high atomic radius element, the substrate region having a graded energy band gap characteristic across its thickness;

an active region abutting the high energy band gap side of the graded structure region;

a passive region abutting the active region, the index of refraction of the active region being higher than the indexes of refraction in the substrate and passive regions and the energy band gap of the active region being lower than the energy band gap of the substrate and passive regions; and

electrodes contacted to the substrate and passive regions, the heterostructure cleaved to form a resonant cavity.

4,813,050

SEMICONDUCTOR LASER DEVICE

Akihiro Shima, and Wataru Susaki, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1987, Ser. No. 54,764
Claims priority, application Japan, May 31, 1986, 61-126505
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—45 11 Claims

1. A semiconductor laser device having a resonant cavity and electrodes, comprising:

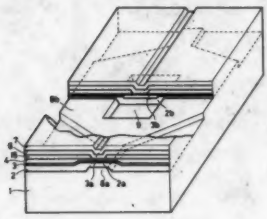
a substrate;

a ridge formed on a main surface of said substrate and extending from one end of the substrate to an opposite end

thereof, wherein the width of said ridge is narrower in regions near both the ends and relatively wider in a middle region;

a depression formed in the wider region of said ridge;

a first clad layer formed over the main surface of said substrate including said depression;



an active layer formed on said first clad layer, wherein the thickness of said active layer is formed to be thinner in portions just above said narrower ridge regions and relatively thicker in a portion just above said wider ridge region between said ends; and

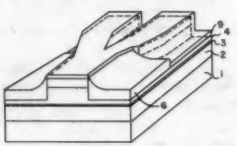
a second clad layer formed on said active layer.

4,813,051

SEMICONDUCTOR LASER ARRAY DEVICE

Mototaka Taneya, Nara; Mitsuhiro Matsumoto, Tenri; Hidenori Kawanishi, Higashiosaka, and Sadayoshi Matsui, Tenri, all of Japan, assignors to 501 Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 20, 1987, Ser. No. 5,056
Claims priority, application Japan, Jan. 21, 1986, 61-11532
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—150 **2 Claims**



1. A semiconductor laser array device comprising a substrate and a multi-layered crystal structure with an active layer for laser oscillating operation, said multi-layered crystal structure being disposed on said substrate, wherein

an area of said multi-layered crystal structure that is positioned above said active layer has a mesa through which current is supplied to said active layer, said mesa extending from a first light-emitting facet to a second light-emitting facet and being composed of a single main portion and a plurality of parallel branching portions,

said main portion of said mesa extending in the oscillation direction from said first light-emitting facet, each of both sides of said main portion of said mesa being buried by an optical absorbent layer by which light within said active layer is absorbed, resulting in a loss waveguide in the area of said mesa,

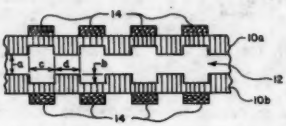
said plurality of parallel branching portions extending from the end of said main portion of said mesa to said second light-emitting facet, both sides of each of said branching portions being free of any optical absorbent layer, resulting in a real index waveguide in the area of said active layer corresponding to said branching portion of said mesa, whereby an active waveguide corresponding to the shape of said mesa is formed within said active layer.

4,813,052

DIELECTRIC RIDGE WAVEGUIDE GAS LASER APPARATUS

Anthony J. DeMaria, West Hartford, Conn., and William Bridges, Pasadena, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 23, 1987, Ser. No. 137,541
Int. Cl.[4] H01S *3/03*
U.S. Cl. 372—64 **19 Claims**



1. A dielectric ridged waveguide flowing gas laser apparatus comprising in combination:

a dielectric substrate having a predetermined number of grooves formed thereon, said grooves extending along the longitudinal axis of said dielectric substrate,

an electrically conductive member in parallel alignment with the grooved side of said dielectric substrate such that an air gap is formed therebetween said air gap containing an active laser gas medium,

electrically conductive strips disposed on the outside of said dielectric substrate forming electrodes, said conductive strips being aligned with said grooves and having the same length and width as said grooves, and

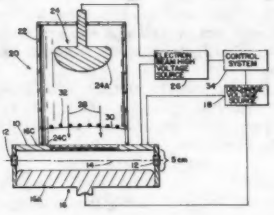
an excitation source connected between said conductive member and said conductive strips, to provide lasing in said ridged waveguide.

4,813,053

METHOD AND APPARATUS FOR PREIONIZING A SELF-SUSTAINED GAS DISCHARGE DEVICE

Charles H. Fisher, and Mark A. DiFaccio, both of Bellevue, Wash., assignors to Spectra-Physics, Inc., San Jose, Calif.

Filed Sep. 30, 1987, Ser. No. 103,930
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—86 **46 Claims**



1. A preionized gas discharge device, comprising:

a container;

an ionizable gas mixture contained within the container;

discharge voltage means for selectively producing a discharge voltage;

electrode means, connected to the discharge voltage means for causing the gas mixture to discharge in response to the discharge voltage imposed across the electrode means by the discharge voltage means;

ionizing beam means located externally of the container for

selectively producing an ionizing beam capable of ionizing the gas mixture and directing the ionizing beam into the container; and

control means for controlling the ionizing beam means and the discharge voltage means, the control means causing the ionizing beam source to direct a pulsed ionizing beam into the container to ionize the gas mixture and subsequently causing the discharge voltage means to impose a pulsed discharge voltage across the electrode means, the duration of the pulsed ionizing beam being substantially shorter than the duration of the pulsed discharge voltage.

4,813,054

DISTRIBUTED FEEDBACK LASER

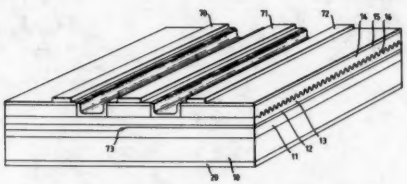
Richard G. S. Plumb, Suffolk, Great Britain, assignor to STC PLC, London, England

Filed Jun. 29, 1987, Ser. No. 67,477

Claims priority, application United Kingdom, Nov. 8, 1986, 8626730

Int. Cl.[4] H01S *3/08*

U.S. Cl. 372—96 **8 Claims**



1. A distributed feedback (DFB) laser having a semiconductor body including a periodic structure formed to modulate the optical propagation constant of laser light propagating within the laser, the semiconductive body having an outer surface and including at least three electrodes on said surface, one of said electrodes comprising a counter-electrode and the remaining electrodes comprising an electrode structure, said electrodes being arranged such that by control of the relative current flow through said electrodes the injected current profile, in the region of modulated optical propagation constant produced by said periodic structure, is adjustable to vary the frequency of the laser output independently of its optical amplitude.

4,813,055

FURNACE COOLING SYSTEM AND METHOD

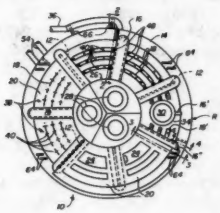
Ronald G. Heggart, Caledonia; Willard K. McClintock, Edison, and Randy J. Engstrom, Marion, all of Ohio, assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 900,168, Aug. 8, 1986, abandoned, Continuation-in-part of Ser. No. 1,636, Oct. 12, 1984, abandoned. This application Dec. 22, 1987, Ser. No. 136,692

The portion of the term of this patent subsequent to Dec. 22, 2004, has been disclaimed.

Int. Cl.[4] F27D *1/12*

U.S. Cl. 373—74 **5 Claims**



1. An apparatus for use in conjunction with a vessel or furnace containing molten metal, said apparatus containing a heated substance and having an inner plate and an outer plate defining an enclosed space therebetween; spray means extending into the enclosed space for directing a spray of fluid coolant against the inner plate for maintaining an acceptable temperature of said plate; and pump means for positively removing the fluid coolant from the enclosed space after the coolant is sprayed against the inner plate whereby undesired buildup of coolant and undesired buildup of pressure of the coolant in the enclosed space are prevented.

4,813,056

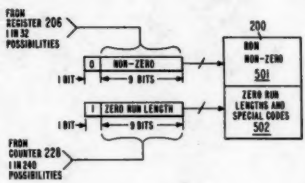
MODIFIED STATISTICAL CODING OF DIGITAL SIGNALS

Nicola J. Fedele, Kingston, N.J., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 8, 1987, Ser. No. 130,379

Int. Cl.[4] H04N *7/12*

U.S. Cl. 375—27 **23 Claims**



1. A statistical encoder for encoding a digitized signal for transmission over a channel, said signal comprising a plurality of different conditions, each condition having a different frequency of occurrence in said signal, said encoder comprising:

first means responsive to said signal for generating a first set of codewords, each representing a different signal condition lying in a range of frequencies of occurrences, the codewords having lengths such that the less frequently occurring words generally are longest and the most frequently occurring words generally are shortest;

second means responsive to said signal for generating a second set of codewords, each word of said second set of words representing a signal condition whose frequency of occurrence is less than the frequency of occurrence of said less frequently occurring words, said second set comprising a number of members whose combined frequency of occurrence is statistically organized in a certain order with said range of frequencies of occurrences, each codeword of said second set including a common codeword portion of a length which is statistically based on said combined frequency of occurrence relative to said range of frequencies of occurrences; and

third means for causing said codewords of said first and second sets to be generated in accordance to the frequency of occurrence of the corresponding conditions of said signal.

4,813,057

TIME DOMAIN RADIO TRANSMISSION SYSTEM

Larry W. Fullerton, Huntsville, Ala., assignor to Charles A. Phillips, Ardmore, Tenn., a part interest

Continuation-in-part of Ser. No. 677,597, Dec. 3, 1984, Pat. No. 4,641,317. This application Feb. 3, 1987, Ser. No. 10,440

Int. Cl.[4] H04B *15/00*; H04K *1/00*; H04L *27/30*

U.S. Cl. 375—37 **8 Claims**

1. A time domain radio transmission system comprising:

a radio transmitter comprising:

pulse generating means for generating reoccurring pulses

units, wherein each pulse unit is comprised of at least one pulse signal,

a source of intelligence signals,

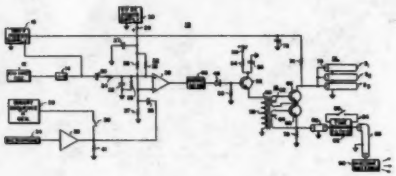
modulation means responsive to said pulse generating means and said source of intelligence signals for providing, as a modulated output, a train of signals wherein at least a discrete edge region of a last-named signal is varied in time position as a function of said intelligence signals,

transmitting antenna means comprising a wide band transmitting antenna,

a D.C. power source, and

power switching means coupled to said wideband transmitting antenna and said power source having a control input responsive to a said modulated output for switching between the states of power applied to said wideband antenna and not being applied to said wideband antenna, whereby discrete switched pulses are transmitted as transmitted signals;

a radio receiver comprising:



receiving means comprising a wide band antenna for receiving transmissions from said transmitting antenna and for providing received signals,

signal generating means responsive to a control signal for generating, repetitively, template signals generally corresponding in time to an average time of occurrence of a said signal portion of a said received signal from a said transmitted signal, and

signal timing means responsive to said received signals and said template signals for generating said control signal; and

demodulation means comprising:

multiplying means responsive to said template signals and said received signals for providing product signals,

signal means including integration means responsive to said product signals for providing an integral signal representative of the integral of said product signal, and

means responsive to said integral signal for reproducing said intelligence signals.

4,813,058

FSK SIGNAL DEMODULATOR

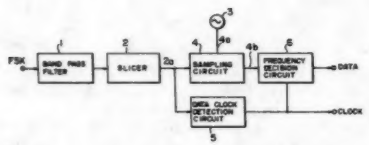
Akihiko Takase, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 13, 1987, Ser. No. 84,900

Claims priority, application Japan, Sep. 1, 1986, 61-203655

Int. Cl.[4] H03D *3/00*

U.S. Cl. 375—82 **5 Claims**



1. A circuit for demodulating a data signal from an FSK signal comprising:

means for converting an input FSK signal into an FSK pulse signal having a mark signal frequency and a space signal frequency;

means for generating a clock signal of a frequency substantially equal to an integral multiple of one of the mark signal frequency and the space signal frequency;

means for sampling the FSK pulse signal at intervals determined by the clock signal;

means for extracting a data clock timing signal from the FSK pulse signal; and

means for providing a data signal by converting the sampled signal to a binary signal on the basis of the data clock timing signal.

4,813,059

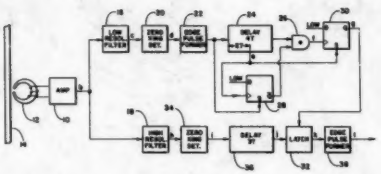
READBACK RECOVERY OF RUN LENGTH LIMITED CODES

Vadim B. Minuhin, and Vernon F. VonDeylen, both of Bloomington, Minn., assignors to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Apr. 15, 1988, Ser. No. 182,264

Int. Cl.[4] H04B *1/66*

U.S. Cl. 375—122 **14 Claims**



1. Apparatus for recovering digital information in a run length limited code comprising:

high resolution recovery means for receiving a read signal and producing a high resolution pulse signal representative of digital information contained in the read signal;

output means responsive to said high resolution pulse signal for providing an output pulse signal representative of the digital information in said read signal;

low resolution recovery means for receiving said read signal and producing a low resolution pulse signal representative of digital information contained in the read signal;

detection means responsive to a predetermined interval of absence of transitions in said low resolution pulse signal; and

disable means responsive to said detection means for disabling said output means.

4,813,060

DENTAL X-RAY DIAGNOSTIC APPARATUS FOR PRODUCING PANORAMA TOMOGRAMS OF THE JAW OF A PATIENT

Erich Heubeck; Werner Günther; Manfred Müther, all of Bensheim, and Leonhard Werner, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 17, 1986, Ser. No. 942,812

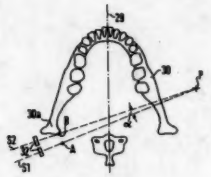
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1985, 3545493

Int. Cl.[4] G03B *41/16*

U.S. Cl. 378—39 **12 Claims**

1. In a dental x-ray diagnostic apparatus for producing panorama tomograms of a jaw of a patient, said apparatus comprising a rotary unit which contains a carrier with a radiation source for producing x-rays and a film cassette holder being mounted on the carrier, said film cassette holder accepting a film cassette containing film, said rotary unit having adjustment means for adjustably rotating the carrier around a first vertical axis with said axis being moved to form an orbit curve

for the cassette corresponding to a dental arch, said film cassette holder and cassette being adjustable so that the teeth are successively imaged on the film together with the jaw and contain at least one detector means adjacent the film cassette for creating an electrical signal corresponding to a dose rate of x-rays incident thereon and supplying said electrical signal for the control of at least a tube voltage of the radiation source, the improvements comprising control means for operating the adjustment means to position the rotary unit in an initial position wherein the path of the x-rays from the radiation source proceed outside of one end of a mandibular arch and onto the film cassette, said detector means measuring an incoming x-ray dosage as the rotary unit moves the path from the initial position spaced from the one end to a second position with the path of the x-rays beginning to pass through the one end of the mandibular arch to generate a signal corresponding to the x-ray dosage to supply to a computation unit associated with the control means, said computation unit having means for comparing the quantity corresponding to the signal to a quantity selecting exposure data for mA, kV and time required for transillumination of an appertaining patient's head from said comparison to control the generator of the radiation source so that for an exposure of the jaw the exposure data is selected before the one end of the jaw is reached by the path of the x-ray and remains constant for the entire time for the path of the x-ray to travel the length of the jaw.

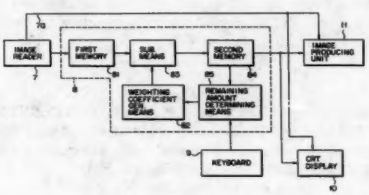


4,813,061

X-RAY DIAGNOSIS METHOD AND APPARATUS

Makoto Kakegawa, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 5, 1987, Ser. No. 81,726
Claims priority, application Japan, Aug. 5, 1986, 61-182654
Int. Cl.[4] H05G 1/64
U.S. Cl. 378—99 **10 Claims**



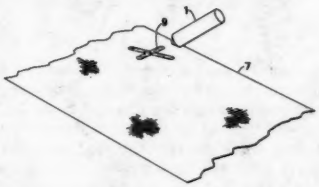
1. An x-ray diagnostic method comprising the steps of:
(a) collecting a plurality of X-ray penetration pictures of the same region of a subject irradiated a plurality of times with different X-ray energies;
(b) performing a subtraction operation between the X-ray penetration pictures obtained with the use of a weighting coefficient;
(c) setting a region of interest (ROI) of said subject on a to-be-eliminated image of an energy subtraction picture obtained at step (b);
(d) determining a remaining amount of said to-be-eliminated image on the subject ROI on the basis of a result of said subtraction operation;
(e) obtaining a weighting coefficient with which said remaining amount of said image becomes minimal; and
(f) obtaining an energy subtraction picture with the use of said weighting coefficient thus obtained in the step (e), wherein said step (d) of determining a remaining amount includes the further steps of:
(d1) obtaining profile data of the to-be-eliminated image;
(d2) enhancing the obtained profile data to form edge-enhanced profile data; and
(d3) calculating data representing portions of said edge-enhanced profile exceeding a preset threshold level for determining said weighting coefficient of step (e).

4,813,062

RADIO-OPAQUE MARKER AND METHOD

Michael W. Gilpatrick, Chesnee, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Aug. 13, 1986, Ser. No. 896,181
Int. Cl.[4] H05G 1/28
U.S. Cl. 378—162 **6 Claims**



1. A marker for placing marks on a surface of an object, which marks are detectable under X-ray illumination, said marker comprising a dispersing medium in which is dispersed a single radio-opaque substance, said dispersing medium being solid at room temperature but, when brought into operable contact with the surface of an object to be marked, exhibits sufficient adhesive character to permit local abrasive transfer of an X-ray observable quantity of said radio-opaque substance to said surface, and wherein said radio-opaque substance consists of finely divided particles of bismuth trioxide.

4,813,063

PHOTOGRAPHIC CASSETTE

Even P. Carmichael; John J. Niedospial; Roger G. Covington, and Bruce R. Muller, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

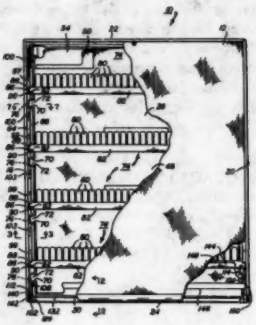
Filed Nov. 25, 1987, Ser. No. 125,315
Int. Cl.[4] G03B 42/04
U.S. Cl. 378—182 **11 Claims**

1. In an x-ray cassette having one end wall with a slot therein through which a sheet is moveable therethrough along an inlet path, an opposite end wall, opposite side walls joining the one end wall and opposite end walls wherein each side wall comprises a channel having spaced cut-outs therein, opposing front and rear cover walls joined to the end walls and side walls, a pressure plate adjacent the rear cover wall having laterally extending tabs on opposite side edges thereof extending into the channels through the cut-outs therein, a floating plate adjacent the front cover wall, the pressure and floating plates having substantially planar interior surfaces in substantially parallel, facing relationship with each other to support the sheet therebetween, pressure applying means for normally biasing the pressure plate toward the floating plate to press the sheet flat between the interior surfaces, a push-bar mechanism mounted in each channel for slidable movement between a normal retracted position and an extended position, and a spring in each channel coupled to the push-bar mechanism for

urging it into its normal retracted position, the improvement comprising:

ears laterally extending from the side edges of the floating plate in register with and spaced from the tabs; and

ramps longitudinally spaced on each push-bar mechanism adapted when the push-bar mechanism is in its normal retracted position to be clear of the ears and tabs, the



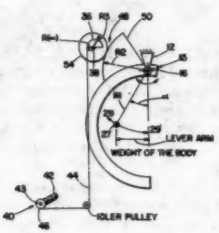
ramps adapted when the push-bar mechanism is moved to its extended position to enter the space between the ears and tabs and to engage the tabs and move the pressure plate toward the rear cover wall, and to override the ears for latching the floating plate to the front cover wall so that the pressure and floating plates are spaced apart for allowing a sheet to freely move into or exit the cassette along the inlet path.

4,813,064

METHOD AND APPARATUS FOR COUNTERBALANCING ROTATING BODIES

David Jackson, III, 1126 Moneta Ave., Aurora, Ohio 44202, and Dale A. Havel, 11631 Lyman Dr., Chesterland, Ohio 44026

Filed Feb. 9, 1987, Ser. No. 12,178
Int. Cl.[4] G01N *21/34*
U.S. Cl. 378—197 **21 Claims**



1. A radiation scanner system comprising:

(a) an arm structure pivotally mounted to a support structure for angular motion about a substantially horizontal arm axis;

(b) means for producing a predetermined force;

(c) a radiation source;

(d) a detector mounted on said arm structure and being spaced from said source to accommodate placement of a subject therebetween;

(e) means for compensating gravitational torque about said arm axis during angular motion, said compensating means comprising:

(i) a cam means rotatively coupled to said arm structure for pivotal motion in response to said angular motion; and

(ii) means for engaging said cam means with said predetermined force; and

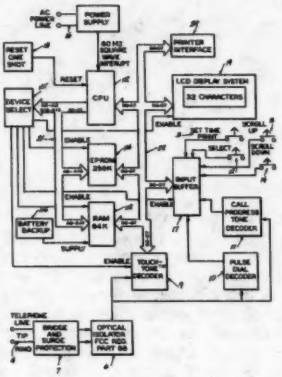
(f) means electrically connected to the detector for producing an image corresponding to radiation incident on said detector.

4,813,065

COMPUTERIZED TELEPHONE ACCOUNTING SYSTEM

James J. Segala, 5 Briarwood La., Wallingford, Conn. 06492

Filed Oct. 13, 1987, Ser. No. 107,562
Int. Cl.[4] H04M *15/04, 15/08, 15/30*
U.S. Cl. 379—112 **10 Claims**



1. A small and compact telephone accounting system incorporating a microprocessor,

decoder means connected to a telephone line for decoding information signals on said telephone line and for producing signals corresponding to the status of telephone calls being made on said telephone line,

memory means for storing a stored data base connected with said microprocessor,

said microprocessor having a clock-calendar,

said memory means incorporating stored programs for causing said microprocessor to automatically calculate the cost of telephone calls in progress in response to said decoded signals and to said data base without any operator input, and to store data corresponding to each such telephone call in said memory.

4,813,066

BATTERY FEED CIRCUIT FOR A TELEPHONE SYSTEM

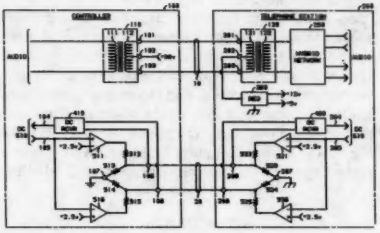
Roger E. Holtz, and Thomas A. Stahl, both of Indianapolis, Ind., assignors to American Telephone and Telegraph Company, AT&T Information Systems, Holmdel, N.J.

Filed Jul. 13, 1987, Ser. No. 72,322
Int. Cl.[4] H04M *3/00, 19/02*
U.S. Cl. 379—413 **13 Claims**

1. A battery feed circuit including a first wire-pair interconnecting a controller and a telephone station, the controller and the telephone station each having a transformer with at least a primary and a secondary winding, said first wire-pair being terminated in the secondary winding of the transformer at each end, each secondary winding having (i) a pair of terminals for connection to the first wire-pair, (ii) a center tap between the pair of terminals for connection to DC power supply circuitry, and (iii) DC continuity between said pair of terminals,

a second wire-pair interconnecting the controller and the telephone station, said second wire-pair being terminated

in a pair of substantially equal series-connected resistors at each end, each pair of series-connected resistors including



a center tap for connection to DC power return circuitry and having DC continuity therebetween.

4,813,067

APPARATUS FOR CONNECTING SELECTIVELY A TELEPHONE ANSWERING DEVICE OR ADDITIONAL EQUIPMENT, SUCH AS A FACSIMILE MACHINE, TO TELEPHONE LINES

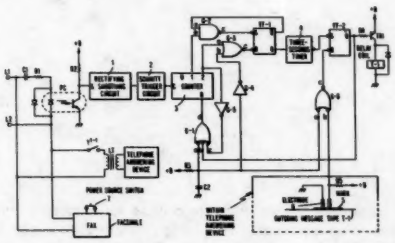
Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Continuation of Ser. No. 823,092, Jan. 21, 1986, abandoned. This application Oct. 5, 1987, Ser. No. 104,086

Claims priority, application Japan, Jan. 21, 1985, 60-8660

Int. Cl.[4] H04M *1/64, 11/00*

U.S. Cl. 379—67 **2 Claims**



1. In a telephone system that receives different incoming telephone calls on a telephone line, an automatic switching device for connecting alternately a telephone answering device and an additional apparatus, such as a facsimile machine, to the telephone line, comprising:

means for detecting incoming calls on the telephone line from a caller who desires to access only one of the telephone answering device and the additional apparatus;

means responsive to a first one of said incoming calls for connecting only one of said telephone answering device and said additional apparatus to the telephone line, whereby as a result of the first call there is a fifty percent probability that the caller will access a desired one of said telephone answering device and said additional apparatus; and

means responsive to the next incoming call on the telephone line for connecting only the other one of said telephone answering device and the additional apparatus to said telephone line, whereby the caller can hang up the first call immediately and place the next call to access the other one of said telephone answering device and said additional apparatus when the caller realizes that the desired one of said telephone answering device and said additional apparatus has not been accessed;

said first and second connecting means connecting alternately said telephone answering device and said additional apparatus in response continuously, to successive incoming calls;

wherein the telephone answering device has a prerecorded outgoing message which instructs the caller to call again if access by the caller as a result of said first call is not to the desired one of said telephone answering device and said additional apparatus.

4,813,068

EASILY OPERABLE AUTOMATIC TELEPHONE ANSWERING/RECORDING APPARATUS

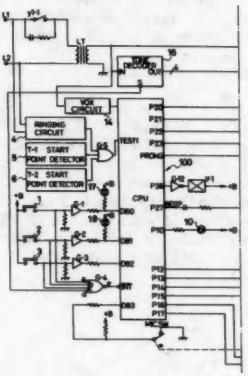
Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Filed Apr. 18, 1986, Ser. No. 853,409

Claims priority, application Japan, Apr. 20, 1985, 60-85068

Int. Cl.[4] H04M *1/65*

U.S. Cl. 379—70 **10 Claims**



1. An easily operable automatic telephone answering-/recording apparatus adapted to be engaged with a telephone line to form a loop circuit upon reception of an incoming call, so as to reproduce an outgoing message from an outgoing message storage medium and send the same message onto the telephone line and thereafter record an incoming message of a calling party in an incoming message storage medium, comprising:

a first operation button;

a second operation button;

a third operation button, each of said three buttons being operable to select one or more corresponding operation modes of the apparatus;

discriminating means for discriminating selective depression of said three operation buttons, for counting the number of times of depression of each said three operation buttons, and for generating a discrimination signal representative of the result of discrimination;

outgoing message recording/playing means for driving said outgoing message storage medium, and for recording said outgoing message in said outgoing message storage medium and reproducing the same message therefrom;

incoming message recording/playing means for driving said incoming message storage medium, and for recording said incoming message in said incoming message storage medium and reproducing the same message therefrom;

setting means for setting the apparatus in its standby mode for an incoming call;

saving means for saving said incoming message recorded in said incoming meassage storage medium; and

control means responsive to said discrimination signal from

said discriminating means for controlling said outgoing message recording/playing means, said incoming message recording/playing means, said setting means and said saving means;

whereby the outgoing message is recordable and the recorded outgoing message is reproduced and thereafter the apparatus is wet in the standby mode when said first operation button is depressed by a first predetermined number of times of depression;

said incoming message being selectively saved in accordance with whether or not said second operation button is depressed;

reproduction of said incoming message, rewind operation of said incoming message storage medium and fast-foward operation of the same medium being effected, respectively, when said third operation button is depressed by second, third, fourth predetermined number of times of depression; and

said incoming message storage medium being stopped when said third operation button is depressed by a fifth predetermined number of times of depression during said reproduction, rewind, or fast-forward operation regarding said incoming message.

4,813,069

COMPUTER SYSTEM HAVING AUTOMATIC ANSWERING TELEPHONE FUNCTION

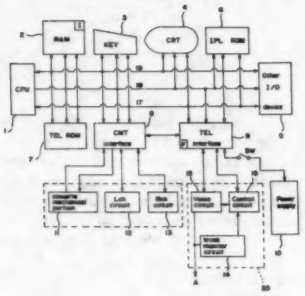
Nobuo Tanaka, Kashiwara; Satoshi Tominaga, Nara; Hisao Okada, Yamatokoriyama, and Toshihiko Yoshida, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 13, 1986, Ser. No. 929,787

Claims priority, application Japan, Nov. 14, 1985, 60-257488

Int. Cl.[4] G06F *9/04, 13/10;* **H04M** *1/64*

U.S. Cl. 379—82 **4 Claims**



1. A computer system for processing data and automatically answering telephone calls arriving on a connected telephone line, comprising:

central processing means for controlling operation of the computer system;

first program means for storing automatic answering and recording programs that are executed in response to a first request by said central processing means;

second program means for storing an operating system program that initializes the computer system for data processing in response to a second request by said central processing means;

telephone call monitoring means for detecting the receipt of telephone calls from the connected telephone line;

cassette recording means for receiving said telephone calls and having a first channel and a second channel for recording and reproducing data from telephone calls, said first channel recording and reproducing analog data and said second channel recording and reproducing digital data;

main power supply means for supplying power to all of the computer system;

auxiliary power supply means for supplying power only to said telephone control means; and

mode setting means for connecting said main power supply means to said computer system when a first mode is selected and for connecting said auxiliary power supply means to said telephone call monitoring means when a second mode is selected, said mode setting means automatically selecting said first mode when said telephone call monitoring means detects a telephone call thereby supplying power to said computer system including said cassette recording means to record data from said telephone call.

4,813,070

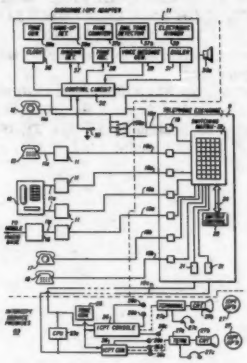
TELEPHONE INTERCEPT SYSTEM

Robert E. Humphreys, Miami, and Steven M. Gray, Coral Gables, both of Fla., assignors to Royal Technology, Inc., Miami, Fla.

Filed Nov. 19, 1987, Ser. No. 122,758

Int. Cl.[4] H04M *3/50, 3/54*

U.S. Cl. 379—213 **35 Claims**



1. Intercept system for intercepting calls from a calling person to an unattended telephone connected to a telephone exchange having three-way calling feature, comprising: at least one intercept console having means for sending a start signal, being attended by an intercept operator, and being connected to the exchange; an intercept adaptor connected to the telephone having: means for generating a specific set of signature tones, automatic dialing means for dialing the intercept console, means for activating the three-way calling feature in response to an incoming call to the telephone; voice recording and playing means; means for sending a digital tone signal identifying the telephone to the intercept operator; signaling means for receiving a start signal from the intercept console to start the voice recording and playing means and receiving a release signal from the intercept console for releasing the three-way calling feature and the intercept adaptor in response to the intercept operator respectively answering the three-way call and releasing it.

4,813,071

LAMINAR TYPE TELEPHONE CONNECTOR BLOCK

Paul V. De Luca, Plandome Manor, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed Aug. 13, 1986, Ser. No. 896,119

Int. Cl.[4] H04Q *1/14*

U.S. Cl. 379—327 **4 Claims**

1. An improved telephone connector block for interconnecting individual subscriber pairs to central office equipment

comprising: first and second elongated support elements, a plurality of generally planar contact holding elements positioned between said support elements in parallel juxtaposed relation, a plurality of contact elements supported upon each of said contact holding elements, and means interconnecting said support elements and contact holding elements in substantially congruent relation; said support elements having means for interconnecting said block to a telephone main frame; said contact holding elements having a principal axis and having first and second planar surfaces, one of said surfaces having a

plurality of paired laterally extending recesses communicating with each other at inner ends thereof; said contact elements each including paired and interconnected quick clip terminals positioned within a corresponding pair of recesses; said contact holding elements, in juxtaposed relation, forming passages for accommodating conductors on either side thereof communicating with one of each of said pairs of laterally extending recesses, whereby outside subscriber pairs may be interconnected on one side of said block, and corresponding inside pairs may be interconnected on an opposite side of said block.

4,813,072

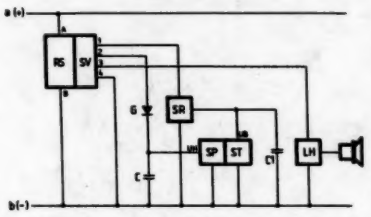
SWITCHING DEVICE FOR POWER SUPPLY TO ADDITIONAL ACCESSORIES FOR A TELEPHONE

Klaus Moses, Frankfurt am Main, and Heinz Lange, Frankfurt, both of Fed. Rep. of Germany, assignors to Telenorma Telefonbau und Normalzeit GmbH, Fed. Rep. of Germany

Filed May 28, 1987, Ser. No. 55,013

Int. Cl.[4] H04M *1/00*

U.S. Cl. 379—388 **4 Claims**



1. A switching device for switching a power supply to additional accessories for a telephone set, said telephone set defining a load switchable in parallel across at least one pair of cable conductors of a telephone network, and when so switched, the cable pair and the load carrying a loop current, comprising:

a current distribution switching device connected to the parallel load and operative to distribute feed currents from the loop current to outputs connected to power the additional accessories, the outputs being assigned priorities and power being switched by said switching device and supplied to said outputs in accordance with an assigned set of priorities, supply voltage for the accessories being increased corresponding to an increased loop current, said accessories including at least a control device for the telephone set which is assigned a highest priority, and said accessories including at least one of a loudspeaker and hands-off device assigned a low priority, and wherein the control device has a memory with its own power supply connection, separate from a power supply to the control device, said power supply connection to the memory being connected to an output assigned a next lower priority below said highest priority and a memory capacitor connected thereto to retain a charge for powering the memory, and a power supply for said at least one of the loudspeaker and the hands-off device being assigned a sequentially lower priority than said next lower priority.

4,813,073

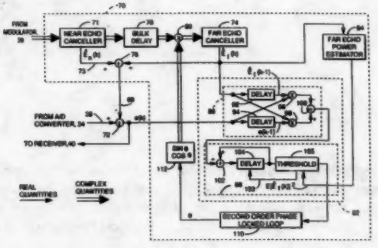
ECHO CANCELLATION

Fuyun Ling, Jamaica Plain, Mass., assignor to Codex Corporation, Mansfield, Mass.

Filed Jul. 2, 1987, Ser. No. 69,250

Int. Cl.[4] H04L *5/14*

U.S. Cl. 379—410 **16 Claims**



1. Echo cancellation apparatus for removing, from a locally received data communication signal, an echo signal component having a changing phase difference relative to the phase of a locally transmitted data communication signal, said locally transmitted communication signal being generated by modulating a carrier based on sequences of complex data signal points, said apparatus comprising

a phase corrector for correcting the phase of an input sequence of complex samples of said modulated carrier based on said changing phase difference to generate complex, phase corrected samples, and

an echo canceller for generating a real valued simulation of said echo signal based on said complex, phase corrected samples.

4,813,074

METHOD OF AND DEVICE FOR SEGMENTING AN ELECTRIC SIGNAL DERIVED FROM AN ACOUSTIC SIGNAL

Stephen M. Marcus, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Filed Nov. 14, 1986, Ser. No. 930,835

Claims priority, application Netherlands, Nov. 29, 1985, 8503304

Int. Cl.[4] G10L *7/02*

U.S. Cl. 381—36 **18 Claims**

1. A method of segmenting an electric signal derived from an acoustic signal into segments of the electric signal in which consecutively

a number of parameters is derived from the electric signal in the form of a number of signals as a function of time,

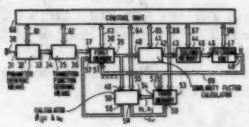
the signals of the parameters located within a time interval around each instant are taken up for consecutive instants,

a transition function ϕ is determined for each instant from the signals of the parameters located within the time interval corresponding to said instant, and

information relating to the segments of the acoustic signal is derived from the transition functions associated with the instants,

characterized in that:

(a) similarity factors C_{ij} are determined, each between two transition functions (ϕ_i and ϕ_j) associated with respective proximate instants i and j, and



(b) a replacing transition function is derived from the transition functions of at least one group of two transition functions for which the associated similarity factor is larger than a reference value V, the said replacing transition function replacing said transition functions from which it is derived.

4,813,075

METHOD FOR DETERMINING THE VARIATION WITH TIME OF A SPEECH PARAMETER AND ARRANGEMENT FOR CARRYIN OUT THE METHOD

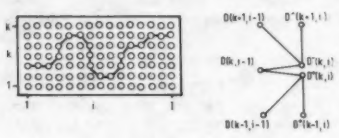
Hermann Ney, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 24, 1987, Ser. No. 125,101

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1986, 3640355

Int. Cl.[4] G10L *5/00*

U.S. Cl. 381—43 4 Claims



1. Method for determining the variation with time of a speech parameter of a speech signal, in which an individual value exists at discrete points in time for each value of a predetermined value range of the speech parameter and the variation with time represents the sequence of adjacent, including diagonally adjacent, speech signal parameter values the individual values of which are at least close to the extreme values of the individual values for the individual points in time, the sum of the individual values of this sequence forming an extreme value sum compared with other sequences, characterized in that, referred to the minimum as extreme value of the individual values and as extreme value sum at each point in time (i), a first direction value D'(k,i) is formed in a first step successively for all speech parameter values (k) following one another in the one direction, as the sum of the individual value concerned d(k,i) and the minimum of the following values

D(k,i−1)

D(l,i−1)+a(d(k,i)+A)

D'(l,i)+b(d(k,i)+A)

as well as a pointing value h'(k,i) pointing to the individual value supplying the minimum and is stored, where D(k,i−1) and D(l,i−1) is a sum value generated and stored at the respectively preceding point in time i−1 and the same speech parameter value k or the preceding speech parameter value l, respectively,

D(l,i) is the direction value formed at the immediately preceding speech parameter value l and

a, b, A are predetermined fixed quantities, that thereafter a second direction value D''(k,i) with a pointing value h''(k,i) is formed, in the manner corresponding to the first step, in a second step for the same point in time i for all speech parameter values k following one another in the other direction, that for each speech parameter value k the minimum of the two direction values D',D'' and the pointing value h',h'' belonging to this direction value is stored as in each case the new and as total pointing value H, respectively, and that the immediately preceding speech parameter value is determined, at the latest at the end of the speech signal, from the total pointing value H(k,I) which belongs to the speech parameter value k with the extreme value sum at the last point in time I and the associated total pointing value is read out and so forth, the sequence of speech parameter values produced during this process being output and stored.

4,813,076

SPEECH PROCESSING APPARATUS AND METHODS

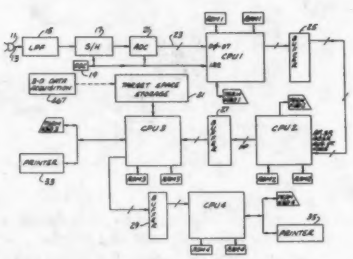
James D. Miller, St. Louis, Mo., assignor to Central Institute for the Deaf, St. Louis, Mo.

Continuation-in-part of Ser. No. 792,965, Oct. 30, 1985, abandoned. This application Jun. 9, 1987, Ser. No. 60,397

Claims priority, application PCT Int'l Appl., Oct. 29, 1986, PCT/US86/02313

Int. Cl.[4] G10L *1/00*

U.S. Cl. 381—43 125 Claims



1. Speech processing apparatus comprising:

memory means for holding prestored information indicative of different phonetic representations corresponding to respective sets of addresses in the memory; and

means for electrically deriving a series of coordinate values of points on a path in a mathematical space from frequency spectra of the speech occurring in successive time intervals respectively, for identifying coordinate values approximating at least one position along the path of a peak in magnitude of acceleration, generating a memory address as a function of the position coordinate values and obtaining from said memory means the phonetic representation information prestored at that memory address.

4,813,077

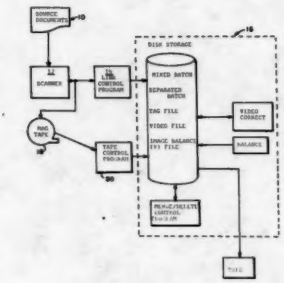
SALES TRANSACTION RECORD PROCESSING SYSTEM AND METHOD

Daniel E. Woods, Vernon; Ronald E. Gocht, Manchester; Peter M. Higgins, Enfield; Anne M. Edwards, West Hartford; Hugh Rowlands, Hartford; Edward F. Scanlon, Ellington, and Jerry Putzer, Rocky Hill, all of Conn., assignors to Scan-Optics, Inc., East Hartford, Conn.

Filed Jul. 30, 1986, Ser. No. 891,869

Int. Cl.[4] G06K *9/00*

U.S. Cl. 382—7 **32 Claims**



1. In a method for the processing of documents relating to business transactions, the documents including summary documents and plural associated individual transaction documents, the documents each including an amount field in which characters representing a dollar amount are manually entered, the method including the delivery of the documents individually to optical character recognition apparatus wherein the amount field is scanned and an attempt is made to recognize the manually entered characters, the improvement comprising the steps of:

scanning the amount field of each document and capturing an image of the dollar amount entered in the scanned field;

digitizing the captured images;

generating a first code which indicates that a captured image is commensurate with a dollar amount;

generating a second code which indicates that not all of the characters comprising a dollar amount image have been recognized by the character recognition apparatus;

generating a preamble for each digitized image, the preambles including information which identifies the image;

incorporating the first code and any generated second code into the preamble of the associated digitized image;

generating a data record for each document, each data record including identification information for the digitized image for the associated document;

storing each digitized image which includes the first code in its preamble in a first file;

storing each digitized image which includes the second code in its preamble in a second file whereby digitized images of dollar amounts may be simultaneously stored in two separate files;

storing the data records having digitized images associated therewith;

sequentially creating a display of each captured image stored in the second file;

amending the data record associated with each displayed image by inserting therein the dollar amount visually perceived from the display;

calculating the total net dollar amount of all of the individual transaction documents associated with a summary document;

comparing the calculated total amount with the amount comprising the data record for the said summary document and providing an indication of whether the calculated amount equals the amount from the summary document;

displaying images stored in digitized form in the first file if the calculated amount does not equal the summary document amount;

comparing each of the displayed images from the first file with the corresponding data record amount;

correcting the data record amount in each case where the comparison indicates a difference; and

recording for further processing all of the document data records subsequent to any amendment and correction.

4,813,078

CHARACTER RECOGNITION APPARATUS

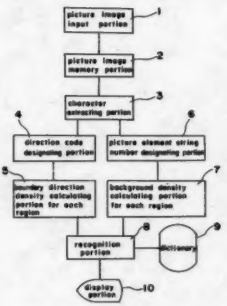
Akie Fujiwara, Moriguchi; Mariko Takenouchi, Ibaraki, and Masahiro Shimizu, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 829,992, Feb. 18, 1986, abandoned. This application Apr. 29, 1988, Ser. No. 188,624

Claims priority, application Japan, Feb. 15, 1985, 60-28655

Int. Cl.[4] G06K *9/48*

U.S. Cl. 382—21 **8 Claims**



1. A character recognition apparatus comprising: a picture image input portion for inputting picture images including recognition object characters; a picture image memory portion for storing said inputted picture images; a character extracting portion for extracting a recognition object character region from said picture image memory portion; a direction code designating portion for designating a direction code of a picture element point of said recognition object character region through its relationship with picture element points adjacent to said picture element point; a direction density calculating portion for obtaining, for each direction code, the number of picture element portions having the same direction code using the information of the direction code for each of said picture element points designated by said direction code designating portion; a change point detection portion for detecting, as at least one change point, a picture element point to be changed from a background portion to a character portion at all times of scanning which is directed from at least one end portion of the recognition object character region to the other end portion thereof and is done in lines on the whole portion of the recognition object character region, and for sequentially ranking the detected change points in order from near said one end portion at every line of the scanning; a background density calculating portion for obtaining, for each group of ranked change points, the number of picture elements from said one end portion or the n−1st change point to the nth change point wherein n is an integer which is equal to or greater than 1; and a recognition portion for extracting a candidate character using the number of picture element points obtained by said direction density calculating portion and the number of picture elements obtained by said background density calculating portion.

DESIGN PATENTS

GRANTED MAR. 14, 1989

ERRATA

For CLASS	See PATENT NO.
D18-037	300,225

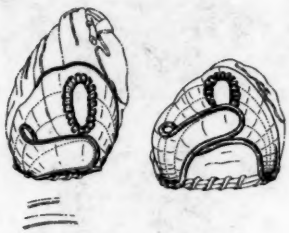
DESIGNS

MARCH 14, 1989

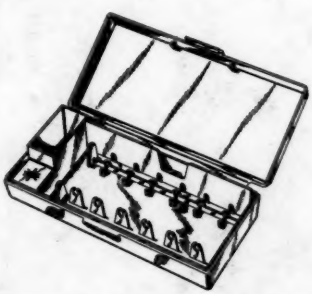
300,180
SHOE
Jean-Pierre Bessec, Paris, and Michel Nodin, Saint-Gervais-Les-3-Clochers, both of France, assignors to Sporloisirs S.A., Geneva, Switzerland
Filed Mar. 12, 1986, Ser. No. 842,869
Claims priority, application France, Sep. 12, 1985, 854265
Term of patent 14 years
U.S. Cl. D2—268

300,181
FOR SHOE UPPER
Suzann Jimenez, Whittier, Calif., assignor to L. A. Gear, Inc., Los Angeles, Calif.
Filed Sep. 21, 1988, Ser. No. 247,422
Term of patent 14 years
U.S. Cl. D2—314

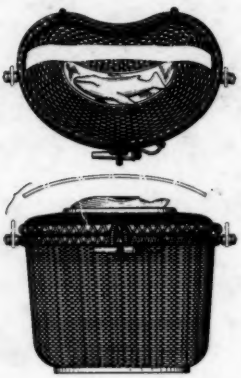
300,182
BACK WALL FOR A BASEBALL GLOVE
Akio Aoki, Osaka, Japan, assignor to Figgie International Inc., Willoughby, Ohio
Filed Aug. 18, 1986, Ser. No. 897,098
Term of patent 14 years
U.S. Cl. D2—623



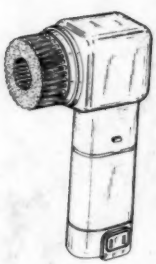
300,183
BOW HUNTER'S ACCESSORY BOX
Steve W. Minneman, Clayton, Ohio, assignor to MTM Molded Products Company, Dayton, Ohio
Filed Feb. 12, 1986, Ser. No. 833,443
Term of patent 14 years
U.S. Cl. D3—38



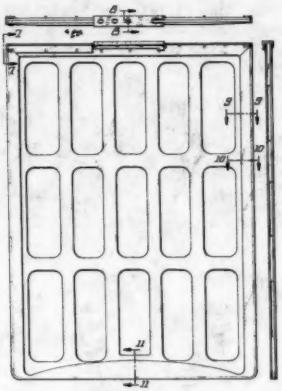
300,184
HANDBAG
Glenaan M. Elliott, Nantucket, Mass., assignor to Glenaan, Inc., Nantucket, Mass.
Filed Dec. 27, 1985, Ser. No. 813,705
Term of patent 14 years
U.S. Cl. D3—51



300,185
SHOE POLISHER
Sigeru Suzuki, Shizuoka, Japan, assignor to Sanyei Electric Co. (HK) Ltd., Hong Kong
Filed Aug. 11, 1986, Ser. No. 895,681
Term of patent 14 years
U.S. Cl. D4—102



300,186
FRAME FOR HOLDING LINOLEUM SAMPLE
Richard Markson, Goshen, N.Y., assignor to Advertising Display Company, Englewood Cliffs, N.J.
Filed Nov. 7, 1985, Ser. No. 795,830
Term of patent 14 years
U.S. Cl. D6—300

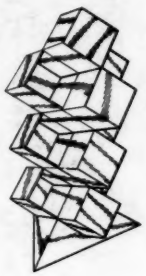


300,187
FOLDING CHAIR
Andriano Suman, Melzo, Italy, assignor to Giorgetti S.P.A., Meda, Italy
Filed Aug. 28, 1986, Ser. No. 901,931
Claims priority, application Italy, Mar. 7, 1986, 21160 B/86[U]
Term of patent 14 years
U.S. Cl. D6—368

300,188
LIFT CHAIR FOR USE PRIMARILY BY THE INVALID AND ELDERLY
Arthur Salerno, 5 Della Ct., Beverly Hills, Fla. 32665
Filed Oct. 20, 1986, Ser. No. 920,889
Term of patent 14 years
U.S. Cl. D6—370

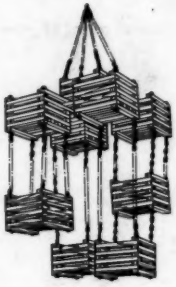
300,189
CHAIR
Richard Frinier, Long Beach, Calif., assignor to Brown Jordan Company, El Monte, Calif.
Filed Sep. 16, 1986, Ser. No. 908,092
Term of patent 14 years
U.S. Cl. D6—379

300,190
DISPLAY STAND
Edward R. Shikatani, Toronto, Canada, assignor to Don Watt & Associates Communications Inc., Toronto, Canada
Continuation of Ser. No. 651,051, Sep. 14, 1984, abandoned. This application Apr. 3, 1987, Ser. No. 33,847
Claims priority, application Canada, Mar. 16, 1984, 16-03-84-1
Term of patent 14 years
U.S. Cl. D6—459

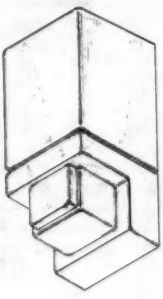


300,191
HANGING MODULAR PLANTER
Norma E. Walsh, 922 S. Federal Hwy., B-3, Dania, Fla. 33004
Filed Dec. 12, 1986, Ser. No. 941,275
Term of patent 14 years
U.S. Cl. D6—514

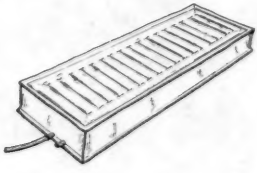
300,192
HANGING MODULAR PLANTER
Norma E. Walsh, 922 S. Federal Hwy., B-3, Dania, Fla. 33004
Filed Dec. 12, 1986, Ser. No. 941,276
Term of patent 14 years
U.S. Cl. D6—514



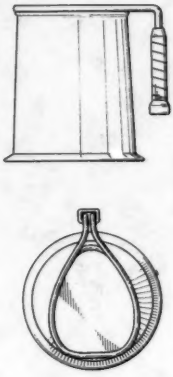
300,193
LIQUID-SOAP DISPENSER
Eric Vignot, Coubron, France, assignor to Alpha-Systems, Vaujours, France
Filed Dec. 9, 1986, Ser. No. 940,026
Claims priority, application France, Jun. 10, 1986, 86 3106
Term of patent 14 years
U.S. Cl. D6—542



300,194
AIR MATTRESS
Robert A. Walker, 519 Fifth St., Elk River, Minn. 55330
Filed Oct. 12, 1984, Ser. No. 660,537
Term of patent 14 years
U.S. Cl. D6—604

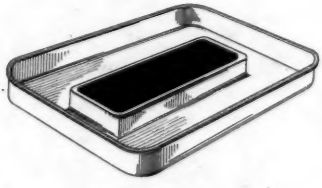


300,195
DRINKING MUG
David B. Pitzer, 1233 Ashbourne Dr., Baton Rouge, La. 70815, and R. Knox Pitzer, 105 Oakridge, San Marcos, Tex. 78666
Filed Oct. 2, 1986, Ser. No. 914,748
Term of patent 14 years
U.S. Cl. D7—5

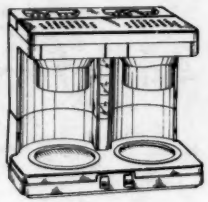


300,196
DECALCOMANIA FOR CHINA DINNERWARE OR SIMILAR ARTICLES
Jeanette Mattson, Syracuse, and Steve A. Unger, Manilus, both of N.Y., assignors to Syracuse China Corporation, Syracuse, N.Y.
Filed Oct. 11, 1985, Ser. No. 786,526
Term of patent 14 years
U.S. Cl. D7—39

300,197
COMBINED FISH AND BAIT CUTTING TRAY
Joseph R. Tingle, 328 S. E. 17th Pl., Cape Coral, Fla. 33904
Filed Sep. 8, 1986, Ser. No. 905,026
Term of patent 14 years
U.S. Cl. D7—46



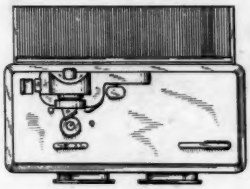
300,198
COFFEE MACHINE
Arthur Eugster, Hofstr. 28a, Romanshorn, Switzerland (CH-8590)
Filed Apr. 15, 1986, Ser. No. 851,707
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1985, URA1281/85
Term of patent 14 years
U.S. Cl. D7—308



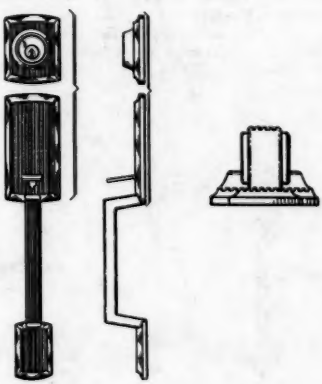
300,199
HEAD FOR A SHOVEL
Neal J. Ipema, Simpsonville, S.C., assignor to Emhart Industries, Inc., Farmington, Conn.
Filed Dec. 3, 1984, Ser. No. 677,629
Term of patent 14 years
U.S. Cl. D8—10

300,200
SOLDERING IRON
Robert W. Arehart, Cook, Ill., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Jan. 14, 1986, Ser. No. 818,691
The portion of the term of this patent subsequent to Mar. 21, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—30

300,201
UNDER-CABINET CAN OPENER
Masao Tsuji, Old Lyme, Conn., assignor to North American Philips Corporation, New York, N.Y.
Filed Dec. 17, 1986, Ser. No. 943,284
Term of patent 14 years
U.S. Cl. D8—37



300,202
COMBINED DOOR HANDLE AND LOCK PLATE UNIT
Milt J. Halsted, San Juan Capistrano, and Karen L. Graham, Long Beach, both of Calif., assignors to Kwikset Corporation, Farmington, Conn.
Filed Apr. 15, 1987, Ser. No. 39,350
Term of patent 14 years
U.S. Cl. D8—302



300,203

COMBINED DOOR HANDLE AND LOCK PLATE UNIT

Milt J. Halsted, San Juan Capistrano, and Karen L. Graham, Long Beach, both of Calif., assignors to Kwikset Corporation, Farmington, Conn.

Filed Apr. 15, 1987, Ser. No. 39,356

Term of patent 14 years

U.S. Cl. D8—302

300,204

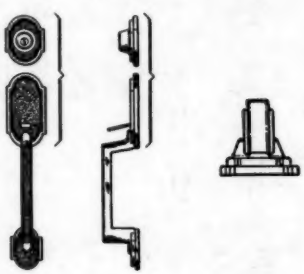
COMBINED DOOR HANDLE AND LOCK PLATE UNIT

Milt J. Halsted, San Juan Capistrano, and Karen L. Graham, Long Beach, both of Calif., assignors to Kwikset Corporation, Farmington, Conn.

Filed Apr. 15, 1987, Ser. No. 39,355

Term of patent 14 years

U.S. Cl. D8—302



300,205

REEL FOR TIGHTENING FILAMENTS

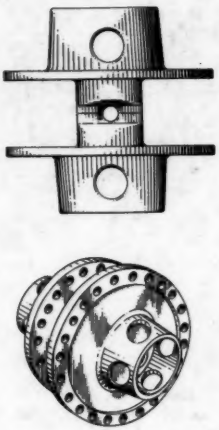
Welby A. E. Watson, 25 Morgan Street, Newmarket, Auckland, New Zealand

Filed Dec. 18, 1985, Ser. No. 810,173

Claims priority, application New Zealand, Jul. 12, 1985, 19909

Term of patent 14 years

U.S. Cl. D8—358



300,206

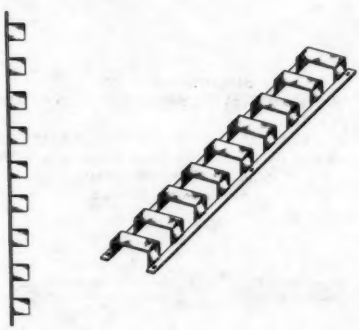
SILK SCREEN RACK BRACKET

Joseph L. Basile, 7258 Hudson Park Dr., Hudson, Ohio 44236

Filed Dec. 17, 1986, Ser. No. 942,854

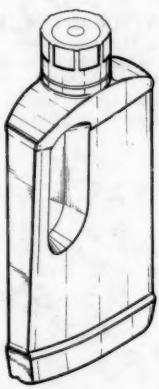
Term of patent 14 years

U.S. Cl. D8—373

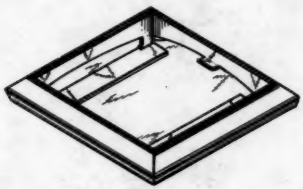


300,207
BAG
Yvonne A. Desbiens, Dollard Des Ormeaux, Canada, assignor to SAKS 2915 Illimite Inc., Ville St-Laurent, Canada
Filed Nov. 12, 1985, Ser. No. 805,039
Term of patent 14 years
U.S. Cl. D9—305

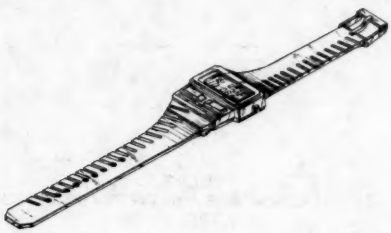
300,208
BOTTLE OR SIMILAR ARTICLE
Thomas Vazquez, West Chester, Pa., and John D. Ferguson, Wilmington, Del., assignors to Armor All Products Corporation, Irvine, Calif.
Filed Dec. 30, 1985, Ser. No. 814,396
Term of patent 14 years
U.S. Cl. D9—378



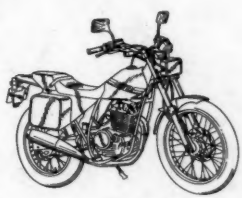
300,209
DISPLAY BOX
Charles E. Finsilver, Hartsdale; Terry L. Taylor, Pound Ridge, both of N.Y., and Harry Roccaforte, Western Springs, Ill., assignors to General Foods Corporation, White Plains, N.Y.
Filed Aug. 16, 1985, Ser. No. 766,175
Term of patent 14 years
U.S. Cl. D9—431



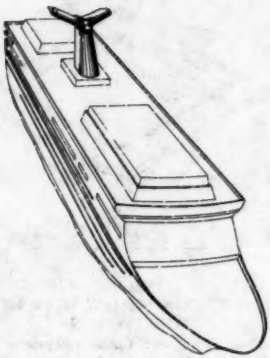
300,210
DIGITAL CHRONOGRAPH ALARM TIMER WRISTWATCH
John T. Houlihan, Watertown, Conn., assignor to Timex Corporation, Middlebury, Conn.
Filed Jun. 5, 1986, Ser. No. 871,605
Term of patent 14 years
U.S. Cl. D10—32



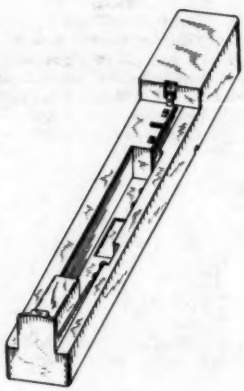
300,211
MOTORCYCLE
Shinichi Yamase, Saitama; Hiroaki Tsukui, and Yoshihiko Aoyama, both of Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 24, 1986, Ser. No. 822,066
Claims priority, application Japan, Jul. 25, 1985, 60-31880
Term of patent 14 years
U.S. Cl. D12—110



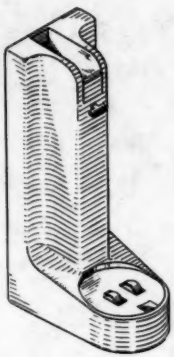
300,212
SHIP'S FUNNEL
Joseph Farcus, Biscayne Park, Fla., assignor to Carnival Cruise Lines, Inc., Miami, Fla.
Filed May 8, 1986, Ser. No. 859,893
Term of patent 14 years
U.S. Cl. D12—317



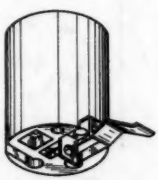
300,213
CHARGER BASE FOR A BATTERY OPERATED ELECTRIC KNIFE
Masao Tsuji, Old Lyme, Conn., assignor to North American Philips Corp., New York, N.Y.
Filed Feb. 21, 1986, Ser. No. 834,851
Term of patent 14 years
U.S. Cl. D13—6



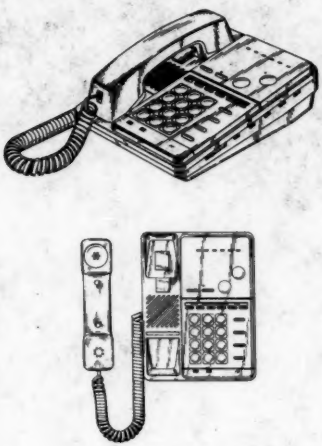
300,214
CHARGER BASE FOR HAND HELD BATTERY OPERATED VACUUM CLEANER
Duane D. Adams, Deep River, Conn., assignor to North American Philips Corporation, New York, N.Y.
Filed Dec. 19, 1985, Ser. No. 810,806
Term of patent 14 years
U.S. Cl. D13—6



300,215
LOCKABLE MOUNT FOR AN ELECTRIC LAMP SOCKET
Stanley S. Brenner, Massapequa, and Charles Chase, East Meadow, both of N.Y., assignors to Leviton Manufacturing Company, Inc., Little Neck, N.Y.
Filed Sep. 24, 1985, Ser. No. 778,263
Term of patent 14 years
U.S. Cl. D13—25



300,216
TELEPHONE SET
Masaaki Iino, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Nov. 19, 1987, Ser. No. 122,660
Claims priority, application Japan, May 28, 1987, 62-20946
Term of patent 14 years
U.S. Cl. D14—151

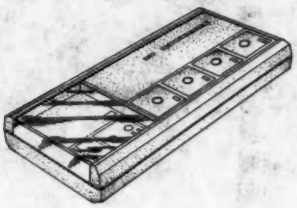


300,217
TELEPHONE SET
Masaaki Iino, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Oct. 19, 1987, Ser. No. 109,610
Claims priority, application Japan, Apr. 27, 1987, 62-16168
Term of patent 14 years
U.S. Cl. D14—150

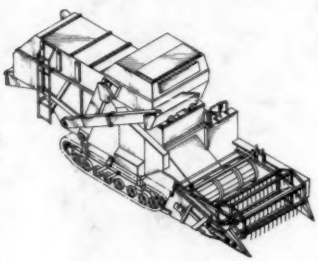
300,218
PORTABLE RADIO TELEPHONE COMMUNICATIONS INSTRUMENT
Ulrich Skrypalle, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Mar. 11, 1987, Ser. No. 24,545
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1986, MR BD10NR16862
Term of patent 14 years
U.S. Cl. D14—138

300,219
PERSONAL COMPUTER
Eberhard Lentz, Adelsdorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Apr. 28, 1986, Ser. No. 857,466
Term of patent 14 years
U.S. Cl. D14—106

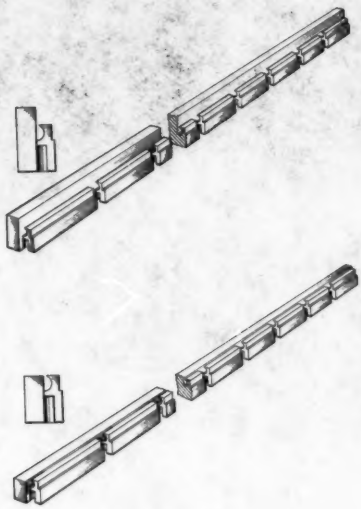
300,220
CONTROL UNIT
Paul M. Schremmer, Hunters Hill, Australia, assignor to Byrne & Davidson Doors (N.S.W.) Pty. Limited, Revesby, Australia
Filed Oct. 15, 1986, Ser. No. 919,335
Claims priority, application Australia, Apr. 15, 1986, 4885/86
Term of patent 14 years
U.S. Cl. D14—218



300,221
COMBINE HARVESTER
Tetsuichi Odahara; Jutaro Eguchi, both of Sakai, and Kinichi Murata, Izumisano, all of Japan, assignors to Kubota, Ltd., Osaka, Japan
Filed Sep. 26, 1985, Ser. No. 781,849
Term of patent 14 years
U.S. Cl. D15—24

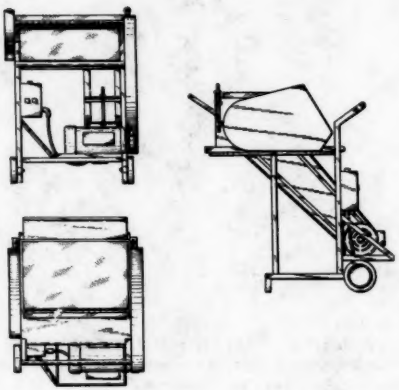


300,222
LONGITUDINAL FRAMEWORK FOR A SCREENING APPARATUS USED IN GRADING ORE OR THE LIKE
William Rutherford, New South Wales, Australia, assignor to Floris Pty. Ltd., New South Wales, Australia
Filed Sep. 6, 1985, Ser. No. 773,433
Claims priority, application Australia, Mar. 12, 1985, 0618/85
Term of patent 14 years
U.S. Cl. D15—28

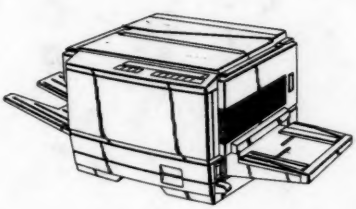


300,223
TINE
David Livingstone, 6 Barcoo Island, Sylvania Waters, New South Wales, Australia (2224)
Filed Jan. 29, 1986, Ser. No. 823,782
Claims priority, application Australia, Jul. 30, 1985, 2030/85
Term of patent 14 years
U.S. Cl. D15—29

300,224
DRY WALL GRINDING MACHINE
Carl C. Schold, 503 Dry Creek Ct., Round Rock, Tex. 78681, and Romeo J. Comeau, 5846 N. Flintwood Rd., Parker, Colo. 80134
Filed Jan. 27, 1986, Ser. No. 822,612
Term of patent 14 years
U.S. Cl. D15—124

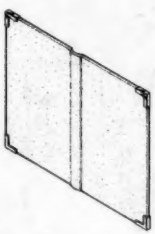


300,225
ELECTROSTATIC COPIER
Kiyotaka Morozumi, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Jul. 11, 1986, Ser. No. 884,619
Claims priority, application Japan, Jan. 13, 1986, 51-000,711
Term of patent 14 years
U.S. Cl. D18—37

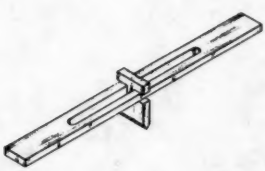


300,226
PAIR OF SUNGLASSES OR THE LIKE
Robert H. Ramp, Pittsford, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Aug. 11, 1986, Ser. No. 904,305
Term of patent 14 years
U.S. Cl. D16—102

300,227
ELECTRONIC CALCULATOR
Isoroku Noguchi, Roselle, N.J., assignor to Aurora Impex Corporation, Kenilworth, N.J.
Filed Apr. 16, 1986, Ser. No. 852,904
Term of patent 14 years
U.S. Cl. D18—2

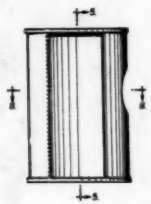


300,228
WEIGHTED BOOK MARKER
Raymond T. Eddins, 8740 Norcross Dr., St. Louis County, Mo. 63126
Filed Mar. 3, 1986, Ser. No. 841,342
Term of patent 14 years
U.S. Cl. D19—34

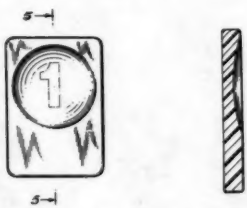


300,229
PEN
Ching-Chang Lee, P.O. Box 70-217, Taipei, Taiwan
Filed Jul. 7, 1986, Ser. No. 882,424
Term of patent 14 years
U.S. Cl. D19—41

300,230
COMBINED TAPE DISPENSER AND CUTTER BLADE
Takashi Yamazaki, Tokyo, Japan, assignor to Johoku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 17, 1985, Ser. No. 809,917
Term of patent 14 years
U.S. Cl. D19—69

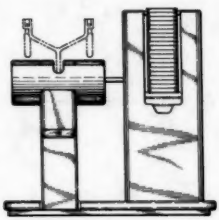


300,231
PLAYING PIECE
Micha Hertzano, 53 Drezner Street, Tel-Aviv, Israel
Filed Aug. 1, 1985, Ser. No. 761,428
Term of patent 14 years
U.S. Cl. D21—51

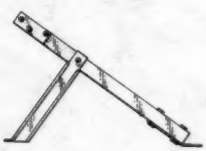


300,232
TOY MUSICAL INSTRUMENT
Pin-Yan Huang, No. 10-5, Alley 20, Lane 49, Chuang Ching Rd., Chung Ho City, Taiwan
Filed Dec. 2, 1986, Ser. No. 937,132
Term of patent 14 years
U.S. Cl. D21—64

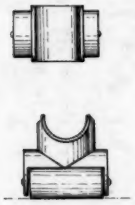
300,233
WEIGHT LIFTING PHYSICAL EXERCISER
John Griffin, Salt Lake City, Utah, assignor to Hoggan Health Industries, Inc., Salt Lake City, Utah
Filed Oct. 16, 1986, Ser. No. 919,863
Term of patent 14 years
U.S. Cl. D21—191



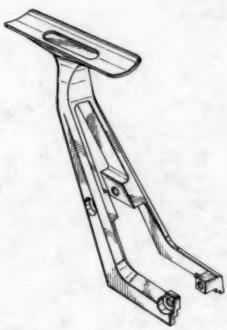
300,234
GUIDE WIRE SUPPORT FOR GYMNASTIC EQUIPMENT
Waldorf C. Eyman, Jr., Keene, N.H., assignor to Gym Trix, Inc., Keene, N.H.
Filed Feb. 13, 1986, Ser. No. 834,018
Term of patent 14 years
U.S. Cl. D21—199



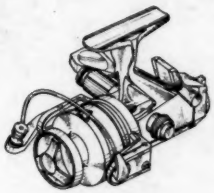
300,235
POOL CUE GUIDE
William A. Nicotra, 1801 Lowrie St., Pittsburgh, Pa. 15212
Filed May 9, 1986, Ser. No. 862,374
Term of patent 14 years
U.S. Cl. D21—232



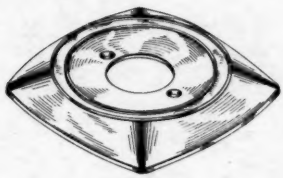
300,236
DETACHABLE FOOT FOR FISHING REELS
Arne Johansson, Mörrum, and Lars-Olof Carlsson, Asarum, both of Sweden, assignors to ABU Garcia Produktion Aktiebolag, Svängsta, Sweden
Filed Jul. 31, 1986, Ser. No. 891,765
Term of patent 14 years
U.S. Cl. D22—137



300,237
FISHING REEL
Seiji Myojo, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Filed Oct. 6, 1986, Ser. No. 916,051
Claims priority, application Japan, May 27, 1986, SHO 61-20,265
Term of patent 14 years
U.S. Cl. D22—141

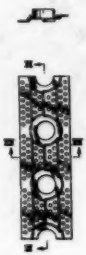


300,238
ESCUTCHEON FOR PLUMBING FITTING
Herbert V. Kohler, Jr., Kohler, Wis., and Paul P. Kolada, Bexley, Ohio, assignors to Kohler Co., Kohler, Wis.
Filed Jan. 16, 1986, Ser. No. 820,202
Term of patent 14 years
U.S. Cl. D23—249

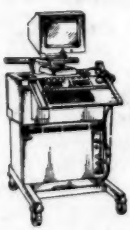


300,239
FAUCET HANDLE
Anthony G. Spangler, Sheridan, Ind., assignor to Masco Corporation of Indiana, Indianapolis, Ind.
Filed Dec. 19, 1986, Ser. No. 944,598
Term of patent 14 years
U.S. Cl. D23—252

300,240
HEAT RADIATION PLATE
Kiyoshi Sakuma, Fujieda; Yoshiaki Tanimura, Shizuoka; Hiroyuki Umemura, Shizuoka; Makoto Yamada, Shizuoka; Ikuo Tsukamoto, Shizuoka; Yu Seshimo, Amagasaki, and Masao Fujii, Takarazuka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 18, 1985, Ser. No. 777,297
Claims priority, application Japan, Mar. 28, 1985, 60-12521; Mar. 28, 1985, 60-12523; Mar. 28, 1985, 60-12525
Term of patent 14 years
U.S. Cl. D23—314



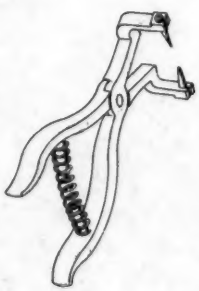
300,241
MEDICAL ULTRASOUND SCANNER
Leroy J. LaCelle; Joseph L. Ungar, both of Redmond, and Gary J. Selke, Bellevue, all of Wash., assignors to Advanced Technology Laboratories, Inc., Bellevue, Wash.
Filed May 13, 1985, Ser. No. 732,995
Term of patent 14 years
U.S. Cl. D24—1.1



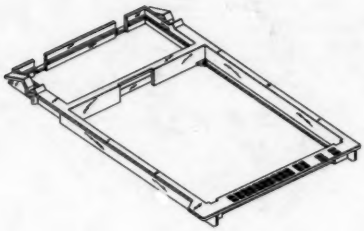
300,242
DENTAL SCALER FOR REMOVING PLAQUE AND TARTAR
Donna J. Coulson, 10799 W. Alameda Ave., Lakewood, Colo. 80226
Filed Mar. 28, 1988, Ser. No. 174,618
Term of patent 14 years
U.S. Cl. D24—10

300,243
DISPOSABLE BIOPSY NEEDLE UNIT
Peter F. Lee, Edina, Minn., assignor to Southland Instruments, Inc., Minneapolis, Minn.
Continuation-in-part of Ser. No. 684,129, Dec. 20, 1984, Pat. No. 4,655,226. This application Jul. 21, 1986, Ser. No. 887,878
Term of patent 14 years
U.S. Cl. D24—24

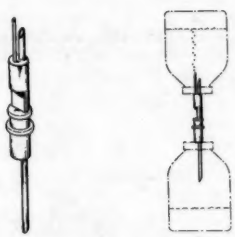
300,244
SURGICAL TOOL FOR PIERCING AND STITCHING STERNA OR THE LIKE
Wilmo C. Orejola, 1012 Black Oak Ridge Rd., Wayne, N.J. 07470
Filed Aug. 15, 1986, Ser. No. 896,737
Term of patent 14 years
U.S. Cl. D24—28



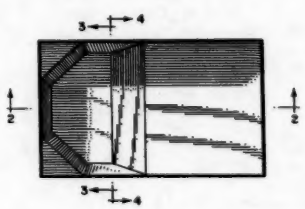
300,245
MICROBIOLOGICAL TEST TRAY CARRIER
Maria C. Navarro, Great Neck; James H. Godsey, North Bellmore, and Richard G. Tepper, Wantagh, all of N.Y., assignors to Sherwood Medical Company, St. Louis, Mo.
Filed Aug. 14, 1986, Ser. No. 896,913
Term of patent 14 years
U.S. Cl. D24—31



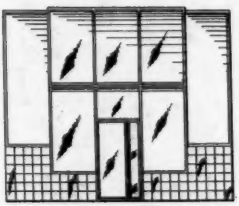
300,246
FLUID TRANSFER NEEDLE
Larry E. Brown, 4422 Summerfield Dr., and Wilton W. Lee, 3578 Twin Oaks Dr., both of Napa, Calif. 94558
Filed Jun. 26, 1986, Ser. No. 879,173
Term of patent 14 years
U.S. Cl. D24—53



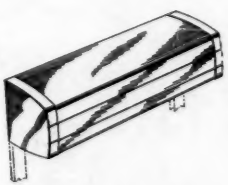
300,247
SWIMMING POOL LINER
Ross J. Eckert, Lakeview, and Domenico Commisso, Clarence, both of N.Y., assignors to Kayak Manufacturing Corp., West Seneca, N.Y.
Filed Sep. 29, 1986, Ser. No. 912,561
Term of patent 14 years
U.S. Cl. D25—2



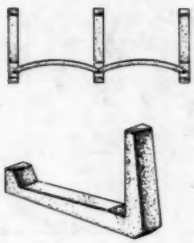
300,248
HOUSING MODULE
Catherine M. P. Anjuere; Patrick M. J. Anjuere, both of 73, rue Saint-Honore, Paris 1er; Bernard Grenot, 11, route du Chene Rogneux, Grosrouvre (Yvelines), and Philippe H. Taffin de Givenchy, 471, Parc de Cassan, L'Isle Adam (Val d'Oise), all of France
Filed Apr. 3, 1986, Ser. No. 847,879
Term of patent 14 years
U.S. Cl. D25—22



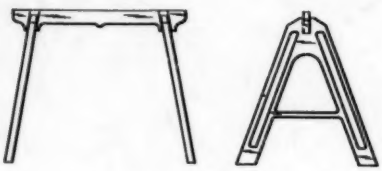
300,249
ROLLING SHUTTER VALANCE
Donald L. Morrison, Huntington Beach, and David W. Schlundt, Rancho Palos Verdes, both of Calif., assignors to The Standard Oil Company, Cleveland, Ohio
Filed Aug. 7, 1985, Ser. No. 763,455
Term of patent 14 years
U.S. Cl. D25—49



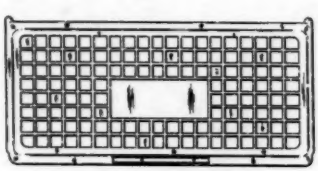
300,250
RETAINING WALL WITH TIE-BACK ELEMENTS
H. Joe Meheen, 1860 Lincoln St., #1026, Denver, Colo. 80295
Division of Ser. No. 836,448, Feb. 25, 1986, Pat. No. Des. 299,170, which is a continuation-in-part of Ser. No. 738,642, May 28, 1985, Pat. No. Des. 298,655. This application Aug. 18, 1988, Ser. No. 233,474
Term of patent 14 years
U.S. Cl. D25—58



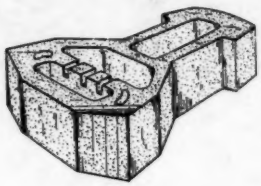
300,251
SAWHORSE
Douglas L. Coryea, 6429 E. Highway 98, Panama City, Fla. 32404
Filed Dec. 8, 1986, Ser. No. 939,019
Term of patent 14 years
U.S. Cl. D25—67



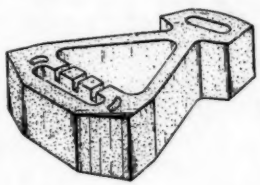
300,252
MOLDED STEP LADDER TOP
Thomas J. Schmitt, Jefferson County, Ky., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Nov. 24, 1986, Ser. No. 934,618
Term of patent 14 years
U.S. Cl. D25—68



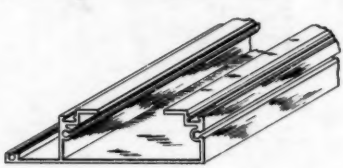
300,253
RETAINING WALL BLOCK
Paul J. Forsberg, Burnsville, Minn., assignor to Keystone Retaining Wall Systems, Inc., Edina, Minn.
Division of Ser. No. 59,481, Jun. 8, 1987, Pat. No. Des. 294,463, and a continuation-in-part of Ser. No. 870,860, Jun. 2, 1986, Pat. No. Des. 297,464, and a continuation-in-part of Ser. No. 869,933, Jun. 2, 1986, Pat. No. Des. 297,574, and a continuation-in-part of Ser. No. 37,444, Apr. 3, 1987, abandoned. This application Jun. 6, 1988, Ser. No. 202,431
Term of patent 14 years
U.S. Cl. D25—114



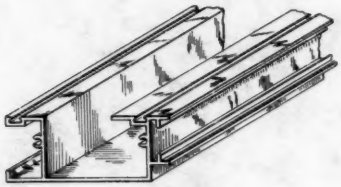
300,254
RETAINING WALL BLOCK
Paul J. Forsberg, Burnsville, Minn., assignor to Keystone Retaining Wall Systems, Inc., Edina, Minn.
Division of Ser. No. 59,481, Jun. 8, 1987, Pat. No. D. 298,463, and a continuation-in-part of Ser. No. 870,860, Jun. 2, 1986, Pat. No. D. 297,464, and a continuation-in-part of Ser. No. 869,933, Jun. 2, 1986, Pat. No. D. 297,574, and a continuation-in-part of Ser. No. 37,444, Apr. 3, 1987, abandoned. This application Jun. 6, 1988, Ser. No. 202,993
Term of patent 14 years
U.S. Cl. D25—114



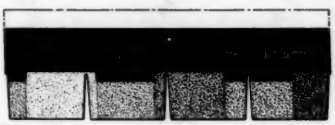
300,255
FRAME MEMBER FOR WINDOWS
Dietrich F. Schmidt, Etters, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jul. 25, 1986, Ser. No. 890,396
Term of patent 14 years
U.S. Cl. D25—119



300,256
FRAME MEMBER FOR WINDOWS
Dietrich F. Schmidt, Etters, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jul. 25, 1986, Ser. No. 889,262
Term of patent 14 years
U.S. Cl. D25—119

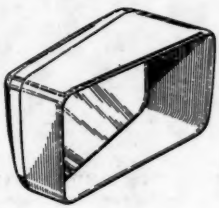


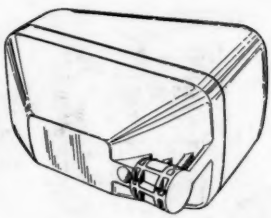
300,257
BUTT SEGMENT OF A SHINGLE
Kermit E. Stahl, Norristown, Pa., assignor to CertainTeed Corporation, Valley Forge, Pa.
Filed Oct. 22, 1985, Ser. No. 790,218
Term of patent 14 years
U.S. Cl. D25—139



300,258
CLAMP-ON CANDLE HURRICANE LAMP
Wesley B. Rubarth, 8734 B Cleta St., Downey, Calif. 90241
Filed Dec. 4, 1986, Ser. No. 938,117
Term of patent 14 years
U.S. Cl. D26—11

300,259
COMBINED HOUSING AND MOUNTING BRACKET FOR VEHICLE LAMP OR MIRROR
Kjell Lungström, Vastra Frölunda, Sweden, assignor to ABL Arbetsbelysning AB, Vastra Frölunda, Sweden
Filed Jul. 30, 1985, Ser. No. 760,723
Claims priority, application Sweden, Jan. 30, 1985, 85-0206
Term of patent 14 years
U.S. Cl. D26—28

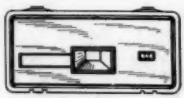


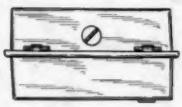


300,260
FINGER-MOUNTED LIGHT
Walter E. Segeren, 208 Miller Dr., Newton, Ala. 36352
Filed Feb. 6, 1986, Ser. No. 826,886
Term of patent 14 years
U.S. Cl. D26—39

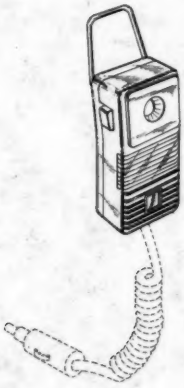
300,261
ADJUSTABLE LAMP
Haim Shwisha, Westport, Conn., assignor to Electrix, Inc., New Haven, Conn.
Filed Mar. 7, 1986, Ser. No. 842,010
Term of patent 14 years
U.S. Cl. D26—63

300,262
PHOTO ELECTRIC CONTROL FOR OUTDOOR FLOODLIGHT OR SIMILAR ARTICLE
Giovanni DeCandia, Germantown, Tenn., assignor to FL Industries, Inc., Livingston, N.J.
Filed May 22, 1986, Ser. No. 866,092
Term of patent 14 years
U.S. Cl. D26—138

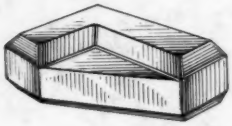


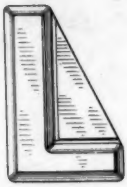


300,263
COMBINATION AUTOMOBILE MAP LIGHT AND ELECTRIC LIGHTER
Pierre Charet, and Duke Kraai, both of Miami, Fla., assignors to Rally Manufacturing, Inc., Miami, Fla.
Filed May 29, 1986, Ser. No. 867,760
Term of patent 14 years
U.S. Cl. D27—142

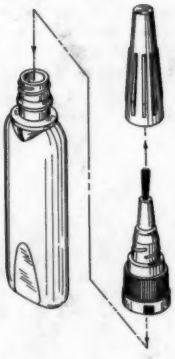


300,264
PHARMACEUTICAL TABLET
Gregory A. Rhoa, Collegeville, and Pravinchandra B. Shah, Warminster, both of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.
Filed Nov. 9, 1987, Ser. No. 118,839
Term of patent 14 years
U.S. Cl. D28—2

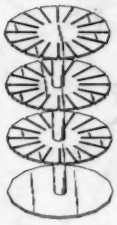




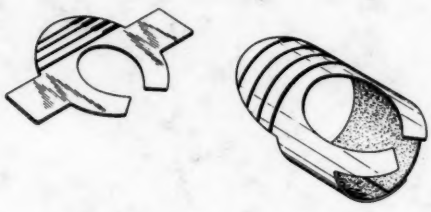
300,265
DESIGN FOR COSMETIC APPLICATOR
Jeffrey M. Brown, Suffern, N.Y.; George S. Lepore, Cliffside Park; Neil D. Scancarella, Wyckoff, both of N.J., and Douglas B. Smith, New Canaan, Conn., assignors to Avon Products, Inc., New York, N.Y.
Filed May 28, 1986, Ser. No. 867,879
Term of patent 14 years
U.S. Cl. D28—7



300,266
HOLDER FOR PERMANENT WAVE CURLING RODS
Johnie P. Lane, R.R. 3, Box 4F, Jones, Okla. 73049
Filed Aug. 14, 1986, Ser. No. 896,516
Term of patent 14 years
U.S. Cl. D28—11

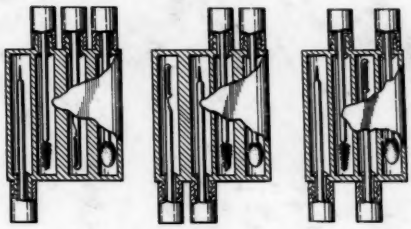


300,267
FINGERNAIL FORM
Janet G. McCormick, Columbus, Ohio, assignor to Nail Concepts, Inc., Dublin, Ohio
Filed Mar. 5, 1986, Ser. No. 841,711
Term of patent 14 years
U.S. Cl. D28—56

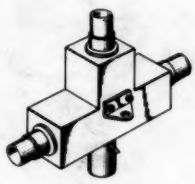


300,268
MANICURE KIT
Siegfried Hölterscheidt, Hückelhoven, Fed. Rep. of Germany, assignor to Walter Henkels GmbH, Fed. Rep. of Germany
Filed Mar. 20, 1987, Ser. No. 28,622
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1987, MR180
Term of patent 14 years
U.S. Cl. D28—61

300,269
COMBINED CONTAINER/BOTTLE AND COSMETIC WAND APPLICATORS OR THE LIKE
Henry J. Cassai, 163-47 85 St., Howard Beach, N.Y. 11414, and Gino H. Cassai, 924 E. 96 St., Brooklyn, N.Y. 11236
Continuation-in-part of Ser. No. 378,872, May 17, 1982, Pat. No. Des. 278,208. This application Oct. 23, 1985, Ser. No. 790,517
Term of patent 14 years
U.S. Cl. D28—77

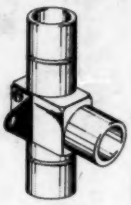


300,270
FOUR-WAY T-SHAPED RESPIRATORY VALVE
Hans Rudolph, Shawnee Mission, and Kevin A. Rudolph, Leawood, both of Kans., assignors to Hans Rudolph, Inc., Kansas City, Mo.
Filed Mar. 16, 1987, Ser. No. 25,926
Term of patent 14 years
U.S. Cl. D29—7

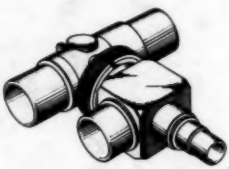


300,271
THREE-WAY T-SHAPED RESPIRATORY VALVE WITH SINGLE BALLOON
Hans Rudolph, Shawnee Mission, and Kevin A. Rudolph, Leawood, both of Kans., assignors to Hans Rudolph Inc., Kansas City, Mo.
Filed Mar. 16, 1987, Ser. No. 25,922
Term of patent 14 years
U.S. Cl. D29—7

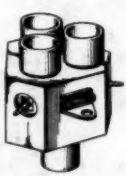
300,272
THREE-WAY T-SHAPED RESPIRATORY VALVE WITH DUAL BALLOON
Hans Rudolph, Shawnee Mission, and Kevin A. Rudolph, Lenexa, both of Kans., assignors to Hans Rudolph, Inc., Kansas City, Mo.
Filed May 18, 1987, Ser. No. 25,924
Term of patent 14 years
U.S. Cl. D29—7



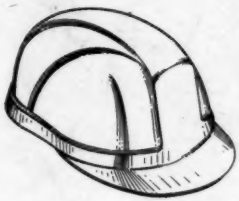
300,273
FOUR WAY RESPIRATORY VALVE WITH DUAL BALLOON
Hans Rudolph, Shawnee Mission, and Kevin A. Rudolph, Lenexa, both of Kans., assignors to Hans Rudolph Inc., Kansas City, Mo.
Filed Mar. 16, 1987, Ser. No. 25,927
Term of patent 14 years
U.S. Cl. D29—7



300,274
FOUR WAY RESPIRATORY VALVE
Hans Rudolph, Shawnee Mission, and Kevin A. Rudolph, Lenexa, both of Kans., assignors to Hans Rudolph, Inc., Kansas City, Mo.
Filed Mar. 16, 1987, Ser. No. 25,925
Term of patent 14 years
U.S. Cl. D29—7



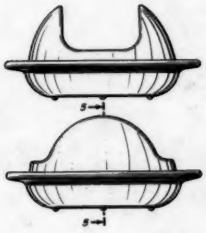
300,275
HELMET
Stig O. Sjögren, Askim, and Rolf A. G. Johansson, Ljungskile, both of Sweden, assignors to Aktiebolaget Electrolux, Sweden
Filed Sep. 29, 1986, Ser. No. 913,851
Claims priority, application Sweden, Apr. 8, 1986, 86-0844
Term of patent 14 years
U.S. Cl. D29—14



300,276
ANIMAL FEEDER
Bjarne J. Bore, N-4060 Kleppe, Norway
Filed Sep. 17, 1987, Ser. No. 97,936
Claims priority, application Norway, Apr. 13, 1987, 68194
Term of patent 14 years
U.S. Cl. D30—121

300,277
AUTOMATIC PET WATERER AND FEEDER
Fred C. Clark, Oklahoma City, Okla., assignor to Lot-A-Wata, Inc., Oklahoma City, Okla.
Filed Feb. 5, 1987, Ser. No. 11,231
Term of patent 14 years
U.S. Cl. D30—122

300,278
PET DISH
James I. Morrell, 2343 N. Rynerson Ct., Simi Valley, Calif. 93065
Filed Jun. 30, 1988, Ser. No. 216,692
Term of patent 14 years
U.S. Cl. 119—61



300,279
WASHING MACHINE
Nobuhiro Umehara, Tokyo; Yoshitoyo Nishite, Yokohama; Kazuhiko Nakao, Tokyo, and Junichi Udagawa, Matsudo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 10, 1986, Ser. No. 905,639
Claims priority, application Japan, Apr. 9, 1986, 61-12704
Term of patent 14 years
U.S. Cl. D32—6

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TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF MARCH, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See*—
Gullichsen, Johan; and Hynninen, Pertti, 4,812,207, Cl. 162-29.000.

A. H. Robins Company, Incorporated: *See*—
Cale, Albert D., Jr., 4,812,565, Cl. 540-491.000.
Shanklin, James R., Jr.; and Wilkinson, James M., II, 4,812,451, Cl. 514-212.000.
Shanklin, James R., Jr.; and Wilkinson, James M., II, 4,812,452, Cl. 514-212.000.

A/S Ferrosan: *See*—
Honore, Tage; Drejer, Jorgen; Jacobsen, Poul; and Nielsen, Flemming E., 4,812,458, Cl. 514-249.000.

Aalto, Erkki; Korhonen, Kaarlo; Pekkinen, Jorma; Sundberg, Esa; Tolmunen, Arvi; Vartiainen, Seppo; and Villikka, Reijo, to Halton Oy. Air exhausting means. 4,811,724, Cl. 126-299.00D.

AB Akerlund & Rausing: *See*—
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Bergstrom, Magnus; Gersbro, Per-Stefan; and Fransson, Jan-Olof, 4,811,957, Cl. 277-1.000.

AB Tetra Pak: *See*—
Rausing, Hans, 4,811,849, Cl. 206-621.200.

AB Volvo: *See*—
Janiszewski, Grzegorz, 4,811,655, Cl. 74-331.000.

Abe, Kazumi: *See*—
Yuasa, Masami; Abe, Kazumi; Shibamoto, Masaji; and Yakabe, Masahiro, 4,812,208, Cl. 162-343.000.

Abe, Kazuyoshi: *See*—
Tamura, Kinichi; Kawada, Susumu; Sekine, Yoshitada; Abe, Kazuyoshi; Ishikawa, Ryosuke; and Yokota, Fumiki, 4,811,935, Cl. 269-34.000.

Abe, Masayoshi: *See*—
Yamazaki, Shunpei; Suzuki, Kunio; Kinka, Mikio; Fukada, Takeshi; Abe, Masayoshi; Kobayashi, Ippei; Shibata, Katsuhiko; Susukida, Masato; Nagayama, Susumu; and Koyanagi, Kaoru, 4,812,415, Cl. 437-2.000.

Abe, Seiichi. Easily testable semiconductor LSI device. 4,812,678, Cl. 307-443.000.

Abe, Shuichi: *See*—
Wada, Hideo; Abe, Shuichi; and Watanabe, Tsuyoshi, 4,812,974, Cl. 364-200.000.

Abe, Yukio: *See*—
Honda, Noriyuki; Abe, Yukio; Isobe, Makoto; and Nakata, Nobuhiro, 4,811,496, Cl. 34-144.000.

Abel, Kenneth N.; and Rudy, John E., to Unisys Corporation. Integrated circuit package having a removable test region for testing for shorts and opens. 4,812,742, Cl. 324-73.00R.

Abou-Gharbia, Magid A., to American Home Products Corporation. Polycyclic spiroimides with psychotropic activity. 4,812,567, Cl. 544-230.000.

Abrams, Robert S. Mold for making an aseptic vial and cap. 4,812,116, Cl. 425-547.000.

Ackeret, Peter. Storage container for disc-form recording media. 4,811,995, Cl. 312-15.000.

Acme General Corporation: *See*—
Gephart, John D.; and Jerila, Torsti T. T., 4,811,683, Cl. 16-97.000.

Adachi, Shigemi; Nakaosa, Yoshitake; and Fujioka, Yoshiki, to Hitachi, Ltd. Emulation method. 4,812,975, Cl. 364-300.000.

Adam, Peter; Sedlmair, Thomas; and Podlech, Manfred, to MTU Motoren-und Turbinen-Union Muenchen GmbH. Apparatus for creep endurance testing structural components. 4,812,052, Cl. 374-50.000.

Adams, Daniel R.; and McKenzie, Richard E., to Merit Technology Incorporated. System and method for optimizing aircraft flight path. 4,812,990, Cl. 364-444.000.

Adana Limited: *See*—
Turner, Arthur, 4,811,688, Cl. 118-674.000.

Adeka Argus Chemical Co., Ltd.: *See*—
Nakahara, Yutaka; Nishimura, Atsushi; and Nakajima, Toshio, 4,812,498, Cl. 524-91.000.

Adhesive Coatings Co.: *See*—
Cummings, Lowell O., 4,812,493, Cl. 523-412.000.

Adir Et Cie: *See*—
Lavielle, Gilbert; and Lepagnol, Jean, 4,812,469, Cl. 514-466.000.

Advanced Micro Devices, Inc.: *See*—
Spak, Michael E.; Tyl, Craig S.; and Wottrich, Philip C., 4,813,015, Cl. 365-78.000.

Aerospatiale Societe Nationale Industrielle: *See*—
Mouille, Rene L., 4,811,627, Cl. 74-665.00L.

Aerovox M, Inc.: *See*—
Melody, Brian; and Clouse, James A., 4,812,951, Cl. 361-504.000.

AGEC AB: *See*—
Larsson, Bertil; Andersson, Erik T.; and H ahansson, Rolf G. R., 4,812,644, Cl. 250-223.00R.

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Reyneri, Leonardo M., 4,813,041, Cl. 370-112.000.

Agfa-Gevaert AG: *See*—
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AGfa-Gevaert Aktiengesellschaft: *See*—
Fuchsberger, Hermann, 4,812,902, Cl. 358-80.000.
Toral, Jose; and Lutz, Gottfried, 4,811,911, Cl. 242-56.00R.
Wagensonner, Eduard; Ruf, Wolfgang; Fuchsberger, Hermann; and Birgmeir, Klaus, 4,812,903, Cl. 358-80.000.
Wolff, Erich; Lowski, Dieter; and Elias, Harry, 4,812,576, Cl. 548-362.000.

Agoston, Agoston, to Tektronix, Inc. Programmable sampling time base circuit. 4,812,769, Cl. 328-63.000.

Ahrens, Paul W., to Miracle Recreation Equipment Company. Playground slide. 4,811,943, Cl. 272-56.50R.

Air Preheater Company, Inc.: *See*—
Cox, William C.; Goetschius, Gary C.; and Casagrande, Mark T., 4,813,003, Cl. 364-557.000.

Aisan Kogyo Kabushiki Kaisha: *See*—
Katumata, Shoji; and Kondo, Shunichi, 4,811,720, Cl. 123-527.000.

Aisin Seiki Kabushiki Kaisha: *See*—
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Ishikawa, Kazuo; and Nishi, Yoshinori, 4,811,827, Cl. 192-0.076.

Ajioka, James S., to Hughes Aircraft Company. Non-reactive radial line power divider/combiner with integral mode filters. 4,812,782, Cl. 330-286.000.

Akamatsu, Osamu: *See*—
Hata, Yasuhisa; and Akamatsu, Osamu, 4,811,651, Cl. 92-29.000.

Akasaka, Akio; Suga, Seiji; and Sawada, Takanori, to Atsugi Motor Parts Company, Limited. Valve timing adjusting mechanism for internal combustion engine for adjusting timing of intake valve and/or exhaust valve corresponding to engine operating conditions. 4,811,698, Cl. 123-90.170.

Akasaka, Sinichi: *See*—
Ohara, Shuichi; Akasaka, Sinichi; Oka, Hiroyuki; and Hattori, Shintaroo, 4,812,439, Cl. 503-227.000.

Akashi, Akira; Ishizaki, Akira; Suda, Yasuo; Ohnuki, Ichiro; Ohtaka, Keiji; and Koyama, Takeshi, to Canon Kabushiki Kaisha. Focus detecting apparatus. 4,812,869, Cl. 354-408.000.

Akasu, Masahira, to Mitsubishi Denki Kabushiki Kaisha. Ignition timing control device for internal combustion engine. 4,811,714, Cl. 123-425.000.

Aki, Shinichi: *See*—
Honjo, Masahiro; Takeuchi, Akihiro; Ochi, Atsuo; Aki, Shinichi; Nakagawa, Yukio; and Kobayashi, Masaaki, 4,812,783, Cl. 331-20.000.

Akiyama, Ryuichi: *See*—
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Aktieselskabet Nordiske Kabel-OG Traadfabriker: *See*—
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Alarm Accessory, Ltd.: *See*—
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Albach, Manfred; Schafer, Ralf; Stormberg, Hans-Peter; and Wegener, Armin, to U.S. Philips Corp. Circuit arrangement for operating high-pressure gas discharge lamps. 4,812,736, Cl. 323-224.000.

Albany International Corp.: *See*—
Coplan, Myron J.; and Giglia, Salvatore, 4,812,184, Cl. 156-84.000.
Romanski, Eric R., 4,812,185, Cl. 156-86.000.

Alberts, Heinrich; and Alteweier, Hans-Bernd, to Bayer Aktiengesellschaft. Polyether siloxane graft polymers. 4,812,364, Cl. 428-447.000.

Albrecht, Lance M.; Pasquini, Mario; and Schreyer, William M., to Food Automation-Service Techniques, Inc. Plural cooking computer communication system. 4,812,963, Cl. 364-131.000.

Alcan Aluminiumwerk Nurnberg GmbH: *See*—
Roach, Fritz, 4,811,654, Cl. 92-216.000.

Alcan International Limited: *See*—
Marwick, William F., 4,812,248, Cl. 252-56.00R.

Alcatel N. V.: *See*—
Valeri, Marco; and Rocchini, Carlo A., 4,813,012, Cl. 364-900.000.

Alcatel NV: *See*—
Debuysscher, Pierre L.; Bauwens, Jan G.; and DeSomer, Michel P. M., 4,813,037, Cl. 370-60.000.

Alexander, Guy B., to Technical Research Assoc., Inc. Oxide dispersion hardened aluminum composition. 4,812,289, Cl. 420-528.000.

Alexandrov, Nicolas; Chretien, Normand; and Fihey, Jean-Luc, to Hydro-Quebec. Oven for thermo-magnetic treatment of toroidal coils

of amorphous ferro-magnetic ribbon material. 4,812,608, Cl. 219-10.750.

Alexandrovich, Peter S.: *See—*
Bugner, Douglas E.; Alexandrovich, Peter S.; DeMejo, Lawrence P.; Guistina, Robert A.; and Anderson, James H., 4,812,378, Cl. 430-110.000.
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Alfred Teves GmbH: *See—*
Reinartz, Hans D.; Steffes, Helmut; Maas, Joachim; and Schwarz, Thomas, 4,811,809, Cl. 180-197.000.

Allen, David J.; Martin, Joseph; Rose, Peter E.; and Terry, John, to Rolls-Royce PLC. Method of manufacturing a metal article by the lost wax casting process. 4,811,778, Cl. 164-516.000.

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Allied-Signal Inc.: *See—*
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Farley, Radcliffe W.; Vaughn, Edward A.; Rodman, Clarke A.; and Homonoff, Edward C., 4,812,283, Cl. 264-518.000.
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Alps Electric Co., Ltd.: *See—*
Hasegawa, Kazuo; Ohuchi, Junichi; and Sasaki, Hiroaki, 4,812,642, Cl. 250-221.000.

Altenschulte, Raymond A.; and Grabow, Glen M., to RCA Licensing Corp. Printed circuit board with mounted terminal. 4,812,130, Cl. 439-84.000.

Alteweier, Hans-Bernd: *See—*
Alberts, Heinrich; and Alteweier, Hans-Bernd, 4,812,364, Cl. 428-447.000.

Altfather, Walter R. Wheel dresser. 4,811,721, Cl. 125-11.0CD.

Aluminum Company of America: *See—*
Cochran, C. Norman; and Brown, Melvin H., 4,812,168, Cl. 75-68.00A.
Sanders, Robert E., Jr.; Kaanta, Henry W.; McBride, John K.; Milner, Milton W.; Perigo, Terry A.; and Shelby, Samuel L., 4,812,183, Cl. 148-439.000.
Story, James M.; and Skiad, Matthew P., 4,811,582, Cl. 72-16.000.

ALZA Corporation: *See—*
Gale, Robert M., 4,812,313, Cl. 424-448.000.

Ambotech Limited: *See—*
Noble, Peter J. W.; and Maskens, Geoffrey D., 4,811,480, Cl. 29-809.000.

Ambrosino, Jean-Louis; Cohen, Chou; Cheron, Jacques; and Rouey, Alexandre, to Institut Francais du Petrole. Working fluid mixtures for use in thermodynamic compression cycles comprising trifluoromethane and chlorodifluoroethane. 4,812,250, Cl. 252-67.000.

Amco Corporation: *See—*
Heideman, Robert C., 4,811,877, Cl. 224-321.000.

Amdahl Corporation: *See—*
Maier, Robert M.; Zmyslowski, Allan J.; and Schober, Caroiee N., 4,812,989, Cl. 364-200.000.

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American Cyanamid Company: *See—*
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American Home Products Corporation: *See—*
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Commons, Thomas J.; Mewshaw, Richard E.; and Strike, Donald F., 4,812,583, Cl. 549-292.000.
Shepherd, Robin G.; Chai, Sie-Yearl; Lichty, Maynard E.; and Milowsky, Arnold S., 4,812,574, Cl. 548-151.000.

American National Can Company: *See—*
Hsu, Joseph C.; and Steen, Robert A., 4,812,319, Cl. 426-127.000.

American Standard Inc.: *See—*
Brandt, George W., 4,811,757, Cl. 137-514.500.

American Telephone and Telegraph Company: *See—*
Andrejco, Matthew J.; and MacChesney, John B., 4,812,153, Cl. 65-3.120.

American Telephone & Telegraph Company, AT&T Bell Laboratories: *See—*
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George, Carroll H.; Lynott, Guy W.; and Pargellis, Andrew N., 4,812,101, Cl. 414-220.000.
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American Telephone and Telegraph Company, AT&T Information Systems: *See—*
Holtz, Roger E.; and Stahl, Thomas A., 4,813,066, Cl. 379-413.000.

Ametani, Kohei: *See—*
Takagi, Touichi; Ametani, Kohei; and Shimizu, Kouichi, 4,812,426, Cl. 501-136.000.

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Bugner, Douglas E.; Alexandrovich, Peter S.; DeMejo, Lawrence P.; Guistina, Robert A.; and Anderson, James H., 4,812,378, Cl. 430-110.000.

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Terada, Takashi; Aoki, Minoru; Ohtaki, Hiroshi; Morozumi, Manami; and Shiozaki, Mitsuharu, 4,812,560, Cl. 536-29.000.

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Okita, Tsutomu; Aonuma, Masashi; and Hashimoto, Hiroshi, 4,812,351, Cl. 428-141.000.

Applied Acoustic Research, Inc.: *See—*
Marciniak, Robert D.; and Poole, Lynn A., 4,811,595, Cl. 73-149.000.

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Wright, Anthony R., 4,812,197, Cl. 156-415.000.

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Tieman, Hans, 4,813,027, Cl. 367-52.000.

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Moore, Paul E., 4,812,610, Cl. 219-70.000.

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Harris, Stephen H., 4,812,553, Cl. 528-272.000.

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Brandsema, Wiebrand-Anno; and Kuipers, Boeli, 4,811,658, Cl. 99-455.000.

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Arnold, Miklos: *See*—
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Rutty, Brian R.; and Walshe, John J., 4,811,862, Cl. 222-63.000.

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Bueschel, David M.; and Wollermann, Kenneth A., 4,811,633, Cl. 81-9.510.

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Iima, Mitsunori, 4,812,026, Cl. 350-454.000.
Sato, Shigetada, 4,812,022, Cl. 350-426.000.

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Asano, Yasuo: *See*—
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Asbrink, Leif; and Graflind, Ulf, to Intermodulation and Safety System AB. Alarm tag. 4,812,811, Cl. 340-571.000.

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Watts, Verne C.; Loraas, Orlan J.; Kaczmarski, Wally L.; and Asche, James E., 4,811,983, Cl. 296-190.000.

ASCII Corporation: *See*—
Nishi, Kazuhiko; Ishii, Takatoshi; Yamashita, Ryozo; Yamaoka, Shigemitsu; and Okumura, Takatoshi, 4,812,828, Cl. 340-706.000.

Asea AB: *See*—
Gunnarsson, Sven-Eric, 4,812,132, Cl. 439-164.000.

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Andrejco, Matthew J.; and MacChesney, John B., 4,812,153, Cl. 65-3.120.

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Cunningham, William D., 4,811,486, Cl. 30-161.000.

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Klein, James D., 4,812,766, Cl. 324-362.000.
Urquhart, Richard G.; and Tawfik, Adel S., 4,812,080, Cl. 405-227.000.

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Devic, Michel; and Angelier, Robert, 4,812,206, Cl. 162-19.000.
Labaig, Jean-Jacques; Fenie, Michel; and Glotin, Michel, 4,812,274, Cl. 264-80.000.
Passimourt, Nadine; and Potin, Philippe, 4,812,297, Cl. 423-300.000.

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Takayama, Sui, 4,811,618, Cl. 74-89.150.

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Akasaka, Akio; Suga, Seiji; and Sawada, Takanori, 4,811,698, Cl. 123-90.170.

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Von Kopp, Guenter, 4,811,728, Cl. 128-201.250.

Augur, Thomas R. Combination single bottle cooler and liquid container. 4,811,858, Cl. 215-13.100.

Aurouet, Claude; Blumenfeld, Henry; Bourdinaud, Michel; Calvet, Jean; Cavan, Jean-Claude; Meyer, Joao; and Thevenin, Jean-Claude. Process for utilizing light radiation with the aid of fluorescent optical fibres and functional devices and apparatus using said process. 4,812,013, Cl. 350-96.290.

Ausnit, Steven; and Nocek, Robert S., to Minigrip, Inc. Apparatus for making bag material. 4,812,074, Cl. 493-213.000.

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Bronzino, Walter; and Bronzino, Pier M., 4,811,963, Cl. 279-5.000.

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Combs, John W., 4,812,294, Cl. 422-72.000.

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Hatfield, R. Andrew, 4,812,772, Cl. 328-145.000.

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Maliya, Prakash; Smith, Colin; and Plamthottam, Sebastian S., 4,812,541, Cl. 526-264.000.

Avex Electronics Inc.: *See*—
Keel, Jerry L.; Hines, Thomas M.; Davis, Glen; and Parks, William E., 4,812,750, Cl. 324-158.00F.

Azo-Maschinenfabrik Adolf Zimmermann GmbH: *See*—
Baumann, Rudolf, 4,812,047, Cl. 366-141.000.

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Morishita, Mimpei; and Azukizawa, Teruo, 4,811,667, Cl. 104-284.000.

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Hiramatsu, Toshiyuki; Azuma, Shizuo; Nakagawa, Koji; and Ichikawa, Yataro, 4,812,163, Cl. 71-92.000.

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Ulrich, Jorn; Weinhold, Friedrich; and Meyer, Meinhard, 4,811,744, Cl. 131-84.100.

B&B Progessive Material & Technologies, Inc.: *See*—
Harris, Kendall R.; Spriggs, Leonard C.; and Block, Ralph J., 4,811,529, Cl. 52-396.000.

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Fry, John J., 4,812,848, Cl. 341-157.000.

Bacuvier, Pierre, to SGS-Thomson Microelectronics S.A. Triac desensitized with respect to re-striking risks on switching across a reactive load. 4,812,893, Cl. 357-39.000.

Baggett, JoBeth. Medication compliance packaging system and procedure. 4,811,845, Cl. 206-534.000.

Baghdachi, Jamil, to Pony Industries, Inc. Polyurea/polyurethane adhesive compositions. 4,812,524, Cl. 525-194.000.

Bagolini, Carlo A.: *See*—
Tinti, Maria O.; Bagolini, Carlo A.; Misiti, Domenico; and Scolastico, Carlo, 4,812,478, Cl. 514-550.000.

Baines, Roger F., to Johnson Electrical Industrial Manufactory, Limited. Solderless connection for an electric motor. 4,812,693, Cl. 310-71.000.

Baird, William C., Jr., to Exxon Research and Engineering Company. Polymetallic reforming catalysts and their preparation. 4,812,435, Cl. 502-227.000.

Bakanowski, Stephen M.; and Mapes, William H., to General Electric Company. Method for testing the operability of a refrigerant system. 4,811,567, Cl. 62-129.000.

Baker Hughes Incorporated: *See*—
Lembcke, Jeffrey J.; and Shaw, Brian, 4,811,792, Cl. 166-381.000.

Baker, James G., to Polaroid Corporation. Camera and two-element viewfinder. 4,812,864, Cl. 354-224.000.

Bakker, Eppe; and Tietjens, Eduard W., to U.S. Philips Corp. Dry-shaving apparatus with self adjusting blades. 4,811,483, Cl. 30-43.600.

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Wijma, Willem S.; Tietjens, Eduard W.; Bakker, Eppe; and Hoekstra, Albert, 4,811,484, Cl. 30-43.600.

Balk, Hermann, to Reifenhauser GmbH & Co. Maschinenfabrik. Apparatus for making a spun fleece from endless synthetic-resin filament. 4,812,112, Cl. 425-66.000.

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Ferrari, Harry M.; and Shallenberger, John M., 4,811,980, Cl. 294-19.200.

Ballas, Robert A.; and Frey, William A., to Du Pont de Nemours, E. I., and Company. Method for detectiong enzymatic activity using particle agglutination. 4,812,395, Cl. 435-7.000.

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Balmer, Charles. Cleaning arrangement for a roller metering device. 4,811,864, Cl. 222-148.000.

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Matsuo, Shigeru; Murakami, Tomoyoshi; Bando, Thoru; and Nagatoshi, Kikuo, 4,812,507, Cl. 524-611.000.

Bandy, Harold C. Clamping assembly for a jack. 4,811,931, Cl. 254-134.000.

Bankuty, Geza E.; Byron, LeRoy F.; and Cianciullo, Joseph J., to New England Machinery, Inc. Apparatus for testing the release torque of container caps. 4,811,850, Cl. 209-546.000.

Banyu Pharmaceutical Co., Ltd.: *See*—
Shirakura, Osamu; Kojima, Hideo; Ouchi, Kiyohisa; and Ishimaru, Sueaki, 4,812,480, Cl. 514-557.000.

Barbet, Karl H.: *See*—
Blumberg, Willy; Schutt, Hans J.; Mette, Ulrich; Barbet, Karl H.; Busse, Fritz; and Klier, Benno, 4,812,073, Cl. 403-134.000.

Barbieux, Jacques, to Sandvik Tobler S.A. Exchange system on an irremovable machining center. 4,812,091, Cl. 409-233.000.

Barcella, Santino; Befeld, Manfred; Faber, Guy; and Slepcevic, Paul, to BBC Brown, Boveri & Company, Ltd. Method of manufacturing a control wheel for the high-pressure rotor of a steam turbine. 4,812,107, Cl. 416-191.000.

Barco Automation N.V.: *See*—
Vanstaen, Roland, 4,812,043, Cl. 356-385.000.

Barenholtz, Yechezkel: *See*—
Harnoy, Gideon N.; Gatt, Shimon; and Barenholtz, Yechezkel, 4,811,791, Cl. 166-305.100.

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Barker, Ronald E. Sweeping apparatus. 4,811,442, Cl. 15-82.000.

Barnett, Gerald W.; and Chen, Tien T., to Glidden Company, The. Small particle size latex based on vinyl acetate polymers. 4,812,510, Cl. 524-807.000.

Barret, Thierry, to Salomon S. A. Ski boot. 4,811,498, Cl. 36-117.000.

Barret, Thierry, to Salomon S.A. Sport shoe. 4,811,502, Cl. 36-117.000.

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Friemel, Wolfgang; Barth, Volker; Munzel, Martin; and Ehret, Reiner, 4,812,291, Cl. 422-28.000.

Barton, Carlos L.; Lindsay, Adrienne; and Henson, Samuel W., to Rogers Corporation. Process for the manufacture of multi-layer circuits with dynamic flexing regions and the flexible circuits made therefrom. 4,812,213, Cl. 204-15.000.

Baseman, Maurice S., to Ronco Laboratories, Inc. Paint composition containing a volatile corrosion inhibitor. 4,812,503, Cl. 524-226.000.

Basf Aktiengesellschaft: *See*—
Fuchs, Harald; Gleiter, Herbert; Trapp, Stephan; and Petermann, Juergen, 4,812,800, Cl. 338-2.000.
Hoelderich, Wolfgang; Goetz, Norbert; and Hupfer, Leopold, 4,812,593, Cl. 560-183.000.
Jahn, Dieter; Keil, Michael; Kolassa, Dieter; Schirmer, Ulrich; Wuerzer, Bruno; Meyer, Norbert; Jung, Johann; and Rademacher, Wilhelm, 4,812,160, Cl. 71-88.000.
Scherzer, Dietrich; Zahn, Erwin; and Frank, Wolfram, 4,812,368, Cl. 428-332.000.
Schwalm, Reinhold; and Binder, Horst, 4,812,542, Cl. 526-265.000.

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Shrewsburg, James E.; and Cole, Edward W., III, 4,812,350, Cl. 428-151.000.

Batra, Pran, deceased; and by Batra, Shanta, legal representative. Correction fluid pen. 4,812,071, Cl. 401-264.000.

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Dvorsky, James E., 4,811,594, Cl. 73-105.000.

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Baugh, Benton F. System and method for providing compressed gas. 4,811,558, Cl. 60-281.000.

Bauman, William C.: *See*—
Burba, John L., III; and Bauman, William C., 4,812,245, Cl. 252-17.000.

Baumann, Dieter, to Ing. Walter Hengst GmbH & Co. KG. Fuel preheater. 4,811,719, Cl. 123-557.000.

Baumann, Rudolf, to Azo-Maschinenefabrik Adolf Zimmermann GmbH. Apparatus for the gravimetric dosing of flowable products. 4,812,047, Cl. 366-141.000.

Baumgartner, Alan S.; Moore, Patrick D.; and VanDahm, Richard A., to Milliken Research Corporation. Colored thermoplastic resin composition. 4,812,141, Cl. 8-506.000.

Bauwens, Jan G.: *See*—
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Baxter Travenol Laboratories, Inc.: *See*—
Borsanyi, Alexander S.; and Cozean, Colette R. D., 4,811,733, Cl. 128-303.140.
McGurk-Burleson, Erin; Koehler, Elmer; and Packham, Victor, 4,811,734, Cl. 128-305.000.

Bayer Aktiengesellschaft: *See*—
Alberts, Heinrich; and Alteweier, Hans-Bernd, 4,812,364, Cl. 428-447.000.
Buysch, Hans-Josef; and Kloker, Werner, 4,812,591, Cl. 560-140.000.
Eckstein, Udo, 4,812,569, Cl. 546-94.000.
Fahner, Karsten; Johannaber, Friedrich; Depcik, Hans-Werner; Kaminski, Axel; and Van Hooren, Rudiger, 4,812,247, Cl. 252-511.000.
Fiedler, Paul; Braden, Rudolf; and Buding, Hartmuth, 4,812,587, Cl. 556-136.000.
Harnisch, Horst; and Raue, Roderich, 4,812,379, Cl. 430-110.000.
Herzog, Helmut; Schutze, Detlef-Ingo; Schneider, Jurgen; and Schmitz, Reinold, 4,812,568, Cl. 546-49.000.
Kress, Hans-Jurgen; Lindner, Christian; Grape, Wolfgang; Peters, Horst; Schoepa, Jochen; and Wittmann, Dieter, 4,812,515, Cl. 525-69.000.
Meurer, Kurt P.; Waniczek, Helmut; Ohm, Christian; and Witte, Josef, 4,812,546, Cl. 526-297.000.
Prater, Klaus; Uerdingen, Walter; Heine, Heinrich; and Freitag, Dieter, 4,812,589, Cl. 558-51.000.
Schallner, Otto; Gehring, Reinhold; Stetter, Jorg; Santel, Hans-Joachim; Schmidt, Robert R.; Lurssen, Klaus; and Strang, Harry, 4,812,165, Cl. 71-92.000.

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Kupske, Peter, 4,811,763, Cl. 141-44.000.
Schier, Guenther, 4,811,807, Cl. 180-141.000.
Winkam, Gamjad; and Lommerzheim, Manfred, 4,811,628, Cl. 74-710.500.

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Bullard, Roy P.; and Bayh, Russell L, III, 4,811,959, Cl. 277-124.000.

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Navratil, Martin; Baytycky, Jimmy P.; Sovak, Mojmir; and Mitchell, Mark, 4,811,787, Cl. 166-273.000.

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Kaufmann, Meinolph; Kloti, Karl; Nehring, Jurgen; and Schad, Hanspeter, 4,812,635, Cl. 250-231.00R.
Plangger, Rico; and Prochazka, Kamil, 4,812,602, Cl. 200-80.00R.

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Barcella, Santino; Befeld, Manfred; Faber, Guy; and Slepcevic, Paul, 4,812,107, Cl. 416-191.000.
Maier, Gunther; Mosele, Joseph; and Perkins, Roger, 4,811,478, Cl. 29-613.000.

Beam, Don E.: *See*—
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Beard, Richard C.; and Crispin, Carl W., to Goodyear Tire & Rubber Company, The. Pressurization of tire mold vents. 4,812,281, Cl. 264-502.000.

Beatty, Glenn E.: *See*—
Hill, Guy J.; Smith, Homer G., Jr.; Schnitker, Mark W.; and Beatty, Glenn E., 4,811,800, Cl. 175-323.000.

Bebermeier, Jurgen; Fischer, Werner; Heitzig, Jurgen; and Eberhard, Gunter, to Continental Aktiengesellschaft. Hydraulically damped resilient mounting. 4,811,934, Cl. 267-140.100.

Becher, Paul F.: *See*—
Moorhead, Arthur J.; Bomar, E. S.; and Becher, Paul F., 4,812,280, Cl. 264-332.000.

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Meyer, Rainer-Leo; John, Reinmar; Nagel, Rolf; and Muller, Gunter, 4,812,356, Cl. 428-220.000.

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Dickerson, Brian E., 4,812,823, Cl. 340-572.000.

Bianco, Andrew S., to Dyson-Kissner-Moran Corporation, The. Liquid container with rotatable spout. 4,811,870, Cl. 222-461.000.

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Billoue, Jean-Paul, to Framatome. Device for the fluidtight closure of an aperture extending through a wall. 4,811,759, Cl. 138-89.000.

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Blackburn, Gary F., to Cornell Research Foundation, Inc. Suspended gate field effect semiconductor pressure transducer device. 4,812,888, Cl. 357-26.000.

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Blanchet, Pierre A. Apparatus for the display of illuminated translucent documents. 4,811,507, Cl. 40-546.000.

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Block, Ralph J.: *See*—
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Bolton, William E.; and Holbert, John C. Apparatus and method for centering logs. 4,811,776, Cl. 144-357.000.

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Bourdon, Guy; Lampin, Dominique; and Leclerc, Daniel, to L'Air Liquide. Process for controlling the flow of a gas in a valve and flow generator employing said process. 4,811,755, Cl. 137-486.000.

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Brand, Larry M., to Procter & Gamble Company, The. Pharmaceutical products providing enhanced analgesia. 4,812,446, Cl. 514-165.000.

Brandeis University: *See*—
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Brandenburg, Bruce L.; Cooley, Curtis D.; and Ellis, Claude E., to Zimpro/Passavant Inc. Process for treating caustic cyanide metal wastes. 4,812,243, Cl. 210-761.000.

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Brauer, Melvin: *See*—
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Braun, Wolfgang; Emsmann, Wulf; Konrath, Karl; Krieger, Klaus; and Nothdurft, Heinz, to Robert Bosch GmbH. Fuel injection pump. 4,811,709, Cl. 123-357.000.

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Oshima, Noboru; Chikatsu, Yoshishige; Fukuhori, Toshiaki; Hamada, Tatsuro; and Fujimaki, Tatsuo, 4,812,525, Cl. 525-232.000.

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Taki, Kazunari, 4,812,637, Cl. 250-201.000.
Yoshida, Noriyuki, 4,811,673, Cl. 112-445.000.

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Brown, Robert G.: *See*—
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Schmalbein, Klaus-Dieter, 4,812,763, Cl. 324-316.000.
Brunolli, Michael J., to Brooktree Corporation. System employing negative feedback for decreasing the response time of a cell. 4,813,023, Cl. 365-207.000.
Brust, Hans-Detlef; and Otto, Johann, to Siemens Aktiengesellschaft. Method and apparatus for operating a scanning microscope. 4,812,748, Cl. 324-158.00R.
Bubat, Alfred: *See*—
Haubennestel, Karlheinz; and Bubat, Alfred, 4,812,518, Cl. 525-100.000.
Bucher, Robert; and Lincke, Paul, to Sulzer Brothers Limited. Weft yarn store for a loom. 4,811,762, Cl. 139-452.000.
Buchmann, Stephan; Leuenberger, Hans; and Reinke, Claudia, to Pharmatronic AG. Membrane, system and process for testing substance diffusion through the membrane and method for making the membrane. 4,812,407, Cl. 435-291.000.
Buck, Reinhold J.: *See*—
Harttig, Erich H.; Buck, Reinhold J.; and Gohl, Hermann J., 4,812,269, Cl. 264-41.000.
Buding, Hartmuth: *See*—
Fiedler, Paul; Braden, Rudolf; and Buding, Hartmuth, 4,812,587, Cl. 556-136.000.
Budinka, Rudolf: *See*—
Maaloe, Jens; Budinka, Rudolf; and Andersen, Svend V., 4,813,042, Cl. 371-16.000.
Buendia, Jean; and Nierat, Jeanine, to Roussel Uclaf. Supports and their use. 4,812,512, Cl. 525-54.110.
Bueschel, David M.; and Wollermann, Kenneth A., to Artos Engineering Company. Adjustable wire stripping apparatus. 4,811,633, Cl. 81-9.510.
Bugner, Douglas E.; Alexandrovich, Peter S.; DeMejo, Lawrence P.; Guistina, Robert A.; and Anderson, James H., to Eastman Kodak Company. Electrostatographic toners and developers containing charge-control agents. 4,812,378, Cl. 430-110.000.
Bugner, Douglas E.; and Alexandrovich, Peter S., to Eastman Kodak Company. Electrostatographic toners and developers containing new charge-control agents. 4,812,380, Cl. 430-110.000.
Bugner, Douglas E.; Alexandrovich, Peter S.; DeMejo, Lawrence P.; and Guistina, Robert A., to Eastman Kodak Company. Electrostatographic toners and developers containing new charge-control agents. 4,812,381, Cl. 430-110.000.
Bugner, Douglas E.; and Alexandrovich, Peter S., to Eastman Kodak Company. Electrostatographic toners and developers containing new charge-control agents. 4,812,382, Cl. 430-110.000.
Buhl, Horst; Kleinekathofer, Wolfgang; and Tank, Eggert, to Daimler-Benz Aktiengesellschaft. Coated valve for internal combustion engine. 4,811,701, Cl. 123-188.0AA.
Buhler, Ulrich: *See*—
Hofmann, Klaus; Buhler, Ulrich; and Dietz, Erwin, 4,812,143, Cl. 8-528.000.
Buhri, Reinhard: *See*—
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Bull, S.A.: *See*—
Anceau, Francois, 4,812,685, Cl. 307-481.000.
Fontan, Jacques; Kurzweil, Karel; and Dehaine, Gerard, 4,812,949, Cl. 361-386.000.
Raulin, Philippe; Messer, Jean-Pierre; Cherbuy, Bernard; and Estavoyer, Jacques, 4,811,476, Cl. 29-603.000.
Bullard, Roy P.; and Bayh, Russell I., III, to Otis Engineering Corporation. Seal assembly for well locking mandrel. 4,811,959, Cl. 277-124.000.
Bullivant, Kenneth W., to K-Tron International, Inc. Vibratory material feeder. 4,811,835, Cl. 198-762.000.
Bunke, Clinton R. Walk ease ski boot soles. 4,811,504, Cl. 36-132.000.
Burba, John L., III; and Bauman, William C., to Dow Chemical Company, The. Intercalations of crystalline lithium aluminates. 4,812,245, Cl. 252-17.000.
Burchett, Roger C., to Burlington Industries, Inc. Print pulse control circuit for electrostatic fluid jet applicator. 4,812,673, Cl. 307-106.000.
Burgio, Joseph T., Jr. Dryer-cooler apparatus. 4,811,493, Cl. 34-4.000.
Burke, Kenneth C.: *See*—
Merchant, Abid N.; Burke, Kenneth C.; and Redenbaugh, Jill M., 4,812,256, Cl. 252-162.000.
Burlington Industries, Inc.: *See*—
Brodmann, George L., 4,812,139, Cl. 8-490.000.
Brodmann, George L., 4,812,142, Cl. 8-512.000.
Burchett, Roger C., 4,812,673, Cl. 307-106.000.
Hansen, John H., 4,812,144, Cl. 8-584.000.
Russell, Ernest J.; and Choi, M. K., 4,812,140, Cl. 8-492.000.
Burns, Richard J.; Grim, Kenneth R.; and Levy, Miguel E., to Hughes Aircraft Company. Analog-digital correlator. 4,813,006, Cl. 364-604.000.
Burr, Philip A.: *See*—
Kennon, James A.; Islam, Shafidul; Popken, Jeffrey L.; Medders, Jerry B.; Fitzgerald, Susan S.; Kelley, Donald R.; and Burr, Philip A., 4,812,114, Cl. 425-116.000.
Burrows, Larry G.: *See*—
Honkomp, Glenn A.; and Burrows, Larry G., 4,811,831, Cl. 198-394.000.
Busenhart, Peter; Schneeberger, Ruedi; Holbein, Erwin; Wirz, Armin; Flueli, Adolf; and Maier, Hansueli, to Rieter Machine Works Limited. Chuck structure. 4,811,910, Cl. 242-18.00R.
Busse, Fritz: *See*—
Blumberg, Willy; Schutt, Hans J.; Mette, Ulrich; Barbet, Karl H.; Busse, Fritz; and Klier, Benno, 4,812,073, Cl. 403-134.000.
Butot, Lucas A., to I.K. International B.V. Device for heating a product by means of dielectric high frequency heating. 4,812,609, Cl. 219-10.810.
Butts, H. Bruce, Jr.; Cutler, David N.; Schnorr, Peter C.; and Short, Robert T., to Digital Equipment Corporation. Central processing unit for a digital computer. 4,812,971, Cl. 364-200.000.
Buysch, Hans-Josef; and Kloker, Werner, to Bayer Aktiengesellschaft. Process for the preparation of bisphenol-bisacrylates. 4,812,591, Cl. 560-140.000.
BYK-Chemie GmbH: *See*—
Haubennestel, Karlheinz; and Bubat, Alfred, 4,812,518, Cl. 525-100.000.
Byren, Robert W.; and Rockwell, David A., to Hughes Aircraft Company. Self-aligning phase conjugate laser. 4,812,639, Cl. 250-203.00R.
Byron, LeRoy F.: *See*—
Bankuty, Geza E.; Byron, LeRoy F.; and Cianciullo, Joseph J., 4,811,850, Cl. 209-546.000.
C. G. Bevan Associates Limited: *See*—
Bevan, Christopher G., 4,812,273, Cl. 264-71.000.
C.I.B., Inc.: *See*—
Gerulis, Benedict R., 4,812,230, Cl. 210-108.000.
Cadotte, John E.; and Schmidt, Donald L., to Dow Chemical Company, The; and Filmtec Corp. Membranes prepared via reaction of diazonium compounds or precursors. 4,812,238, Cl. 210-636.000.
Cadotte, John E.; and Walker, David R., to Filmtec Corporation. Novel water softening membranes. 4,812,270, Cl. 264-48.000.
Cadtrak Corporation: *See*—
Wells, Charles H., 4,812,834, Cl. 340-721.000.
Cadware Group, Ltd., The: *See*—
Dunn, Robert M., 4,813,013, Cl. 364-900.000.
Calanchi, Massimo: *See*—
Rossi, Piergiorgio; and Calanchi, Massimo, 4,812,316, Cl. 424-468.000.
Calatayud, Jose: *See*—
Montoro, Fernando; Calatayud, Jose; and Luna, Manuel, 4,812,482, Cl. 514-649.000.
Caldwell Manufacturing Company: *See*—
Ost, Wilford G.; and Westfall, Norman R., 4,811,455, Cl. 16-197.000.
Cale, Albert D., Jr., to A. H. Robins Company, Incorporated. Fused aromatic oxazepinones, thiazepinones, diazepinones and sulfur analogs thereof. 4,812,565, Cl. 540-491.000.
California Institute of Technology: *See*—
Davarian, Faramaz; and Sumida, Joe T., 4,812,786, Cl. 332-16.00R.
California Pellet Mill Company: *See*—
Pierik, Henry, 4,812,324, Cl. 426-624.000.
Calvet, Jean: *See*—
Aurouet, Claude; Blumenfeld, Henry; Bourdinaud, Michel; Calvet, Jean; Cavan, Jean-Claude; Meyer, Joao; and Thevenin, Jean-Claude, 4,812,013, Cl. 350-96.290.
Cameron, G. N., Jr. Holder for machining thin walled cylinder. 4,811,962, Cl. 279-2.00A.
Cameron Iron Works USA, Inc.: *See*—
Theiss, David H., 4,811,784, Cl. 166-208.000.
Campbell, Arthur L.; and Miyano, Masateru, to G. D. Searle & Co. Kojic acid ether-ester derivatives. 4,812,474, Cl. 514-460.000.
Campbell, Bruce L.: *See*—
Salesky, William J.; and Campbell, Bruce L., 4,811,801, Cl. 175-329.000.
Cams, Inc.: *See*—
Corrothers, Robert S., 4,812,722, Cl. 318-561.000.
Canadian Patents and Development Limited/Societe Canadienne des Brevets et D'Exploitation Limitee: *See*—
Nadeau, Francois; and Braeuel, Michael T., 4,811,605, Cl. 73-645.000.
Canon Kabushiki Kaisha: *See*—
Akashi, Akira; Ishizaki, Akira; Suda, Yasuo; Ohnuki, Ichiro; Ohtaka, Keiji; and Koyama, Takeshi, 4,812,869, Cl. 354-408.000.
Endo, Kiyonobu, 4,812,020, Cl. 350-409.000.
Goto, Susumu; Kumabe, Yuichi; and Okunuki, Masahiko, 4,812,662, Cl. 250-491.100.
Hirooka, Masaaki; Ueki, Masao; Hanna, Jun-Ichi; and Shimizu, Isamu, 4,812,331, Cl. 427-255.100.
Iizuka, Toshimi; and Kamata, Shigeru, 4,812,015, Cl. 350-252.000.
Ishihara, Shunichi; Hanna, Junichi; and Shimizu, Isamu, 4,812,325, Cl. 427-69.000.
Ishikawa, Yasuyuki, 4,812,033, Cl. 351-208.000.
Ishinaga, Hiroyuki, 4,812,062, Cl. 400-157.200.
Kadowaki, Hidejiro; Hosaka, Akihito; and Matsumoto, Kenichi, 4,812,900, Cl. 358-75.000.
Kawamura, Masaharu, 4,812,870, Cl. 354-412.000.
Komiya, Yutaka, 4,812,910, Cl. 358-282.000.
Koyama, Osamu, 4,813,032, Cl. 369-13.000.

Kubota, Atsushi; Sasaki, Nobukazu; Kasamura, Toshirou; Kusumoto, Toshihiko; Shiratori, Tatsuya; Ozawa, Takashi; Yamamoto, Yasuyoshi; Koike, Michiro; Ohashi, Masashi; and Kimura, Akiyoshi, 4,812,874, Cl. 355-7.000.
Mukaiya, Hitoshi, 4,812,024, Cl. 350-427.000.
Nagashima, Yoshitake; Ishikawa, Hisashi; Kozuki, Susumu; Yoshimura, Katsuji; Takahashi, Koji; and Nagasawa, Kenichi, 4,812,920, Cl. 358-310.000.
Ohshima, Shigeru; and Sekiguchi, Takeshi, 4,812,911, Cl. 358-225.000.
Saitoh, Keishi; Hirooka, Masaaki; Hanna, Junichi; and Simizu, Isamu, 4,812,328, Cl. 427-69.000.
Sakai, Shinji; Kawabata, Takashi; and Miyamoto, Ryosuke, 4,812,727, Cl. 318-696.000.
Yoshinaga, Kazuo; Katagiri, Kazuharu; and Shinjo, Kenji, 4,812,259, Cl. 252-299.650.
Caporusso, Alessandro; and Caporusso, Mario. Fork member for pipe-bending apparatus to support spaced pipe abutment. 4,811,589, Cl. 72-389.000.
Caporusso, Mario: *See*—
Caporusso, Alessandro; and Caporusso, Mario, 4,811,589, Cl. 72-389.000.
Carbone, Anthony K. Method and apparatus for scanning and digitizing optical images. 4,812,918, Cl. 358-293.000.
Carenzi, Angelo: *See*—
Ferrrari, Vittorio; Carenzi, Angelo; and Della Bella, Davide, 4,812,477, Cl. 514-513.000.
Carl-Zeiss Stiftung: *See*—
Egle, Wilhelm; Ottensmeyer, F. Peter; and Rilk, Albrecht, 4,812,652, Cl. 250-311.000.
Carleton, Samuel A., to North American Philips Corporation. Gas flow device for welding electrode. 4,812,611, Cl. 219-74.000.
Carlingswitch, Inc.: *See*—
Krasij, Bohdan, 4,812,793, Cl. 335-8.000.
Carlisle, Arthur W.; Darden, Bruce V.; and Myers, Clyde J., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Optical fiber connector. 4,812,009, Cl. 350-96.210.
Carlyle, Richard. Automobile window shield and covering. 4,811,982, Cl. 296-95.100.
Carmichael, Even P.; Niedospial, John J.; Covington, Roger G.; and Muller, Bruce R., to Eastman Kodak Company. Photographic cassette. 4,813,063, Cl. 378-182.000.
Carnegie-Mellon University: *See*—
Kaufman, William M.; and Guzman, Alberto, 4,812,826, Cl. 340-682.000.
Carrier Corporation: *See*—
Currier, Frederick A.; and Herb, Carl C., 4,811,575, Cl. 98-41.100.
Etemad, Shahrokh; Yannascoli, Donald; and Hatzikazakis, Michael, 4,811,471, Cl. 29-156.40R.
Jennings, William B.; Thompson, John; and Hayes, Richmond S., Jr., 4,811,570, Cl. 62-263.000.
Casagrande, Mark T.: *See*—
Cox, William C.; Goetschius, Gary C.; and Casagrande, Mark T., 4,813,003, Cl. 364-557.000.
Casanova, Hector A.: *See*—
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CasChem, Inc.: *See*—
Simone, Dominic; and Brauer, Melvin, 4,812,533, Cl. 525-437.000.
Casey, Brendan: *See*—
Sheridan, Nicholas K.; Stearns, Richard G.; Frank, John A.; Casey, Brendan; and Gary, William, 4,812,860, Cl. 346-159.000.
Casper Colosimo & Son, Inc.: *See*—
Johnson, Harry; and Ware, Ralph M., 4,812,079, Cl. 405-164.000.
Casper, Paul W.: *See*—
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Cassella Aktiengesellschaft: *See*—
Hofmann, Klaus; Buhler, Ulrich; and Dietz, Erwin, 4,812,143, Cl. 8-528.000.
Cassese, Ferdinando, to Ferrari Engineering S.p.A. Rear frame forming part of a supporting structure of a motor vehicle. 4,811,812, Cl. 180-295.000.
Cassese, Ferdinando, to Ferrari Engineering S.p.A. Front frame forming part of a supporting structure of a motor vehicle. 4,811,970, Cl. 280-788.000.
Cassidy, Frederick: *See*—
Evans, John M.; Stemp, Geoffrey; and Cassidy, Frederick, 4,812,459, Cl. 514-254.000.
Cassidy, Michael F.: *See*—
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Cavan, Jean-Claude: *See*—
Aurouet, Claude; Blumenfeld, Henry; Bourdinaud, Michel; Calvet, Jean; Cavan, Jean-Claude; Meyer, Joao; and Thevenin, Jean-Claude, 4,812,013, Cl. 350-96.290.
Cawley, William E.; and Mercer, Basil W., to Bio Tech, Inc. Water recycle system. 4,812,237, Cl. 210-605.000.
CD Medical Inc.: *See*—
Mills, Gary N.; and Willock, Charles B., 4,812,239, Cl. 210-647.000.
Central Electricity Generating Board, The: *See*—
Roberts, Ian A.; and Hargis, Colin, 4,812,751, Cl. 324-546.000.
Central Institute for the Deaf: *See*—
Miller, James D., 4,813,076, Cl. 381-43.000.
Centre National de la Recherche Scientifique: *See*—
Aubert, Guy, 4,812,765, Cl. 324-320.000.
Centro Sviluppo Materiali S.p.A.: *See*—
Tamba, Alberto; Fioravanti, Silverio; and Scaccia, Antonio, 4,812,288, Cl. 420-443.000.
Ceram-Sna, Inc.: *See*—
Delvaux, Pierre; and Lesmerises, Normand, 4,812,204, Cl. 162-3.000.
Ceste, Mario G., Sr., to Food Automation-Service Techniques, Inc. Temperature control system for cooking apparatus. 4,812,625, Cl. 219-497.000.
Chai, Sie-Yearl: *See*—
Shepherd, Robin G.; Chai, Sie-Yearl; Lichty, Maynard E.; and Milowsky, Arnold S., 4,812,574, Cl. 548-151.000.
Chalfant, Richard W.: *See*—
Quearry, Robert W.; Chalfant, Robert D.; Chalfant, Richard W.; and Liggett, Robert E., 4,811,989, Cl. 300-21.000.
Quearry, Robert W.; Chalfant, Robert D.; Chalfant, Richard W.; and Liggett, Robert E., 4,811,990, Cl. 300-21.000.
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Quearry, Robert W.; Chalfant, Robert D.; Chalfant, Richard W.; and Liggett, Robert E., 4,811,989, Cl. 300-21.000.
Quearry, Robert W.; Chalfant, Robert D.; Chalfant, Richard W.; and Liggett, Robert E., 4,811,990, Cl. 300-21.000.
Champion, C. Paul, III; Libero, Robert W.; and Palmer, Walter J. Telephone accessible information system. 4,812,843, Cl. 340-905.000.
Chan, C. S.; Hanson, Gary E.; and Nelson, Terry M., to Hewlett-Packard Company. Multi-chamber ink jet recording head for color use. 4,812,859, Cl. 346-140.00R.
Chan, Carl; and Feustel, Edwar A., to Prime Computer, Inc. Memory management system improving the efficiency of fork operations. 4,812,981, Cl. 364-200.000.
Chang, David C. K.: *See*—
Gilmer, Thomas C.; and Chang, David C. K., 4,812,506, Cl. 524-512.000.
Chang, Donald C. D.: *See*—
Wong, Mon N.; Patin, Robert J.; Fishkin, Theodore S.; and Chang, Donald C. D., 4,812,788, Cl. 333-113.000.
Chang, Kern K. N., to RCA Licensing Corp. Thin cathode-ray tube. 4,812,708, Cl. 313-477.00R.
Chao, Kuo-Hua, to Shell Oil Company. Alkylation of amine compounds. 4,812,595, Cl. 564-463.000.
Chao, Suyueh: *See*—
Huang, Mijuel E. J.; Chao, Suyueh; Yu, Chin-Ching; and Hsu, Chi-Chu, 4,811,495, Cl. 34-131.000.
Chao, Tai-Hsiang, to Allied-Signal Inc. Stepwise formation of channel walls in honeycomb structures. 4,812,276, Cl. 264-177.110.
Chappel, Bernard, to Societe Pour L'Application De L'Optique et de L'Electronique a la Recherche et a L'Automatiaation Optelec. Electric transformer for microwave ovens. 4,812,798, Cl. 336-98.000.
Charles Stark Draper Laboratory, Inc., The: *See*—
Araujo, Richard K., 4,812,654, Cl. 250-338.100.
Chastain, David M.; and Gostin, Gary B., to Convex Computer Corporation. Microcode computer having dispatch and main control stores for storing the first and the remaining microinstructions of machine instructions. 4,812,972, Cl. 364-200.000.
Chatwin, Ian M. Electronic surveillance system and transceiver unit therefor. 4,812,820, Cl. 340-518.000.
Chau, Michael M.: *See*—
Makhlouf, Joseph M.; Chau, Michael M.; and Freid, James R., 4,812,508, Cl. 524-764.000.
Chemie Linz Akteingesellschaft: *See*—
Binder, Dieter; and Rovenszky, Franz, 4,812,472, Cl. 514-374.000.
Chen, Chin H.: *See*—
Goswami, Ramanuj; and Chen, Chin H., 4,812,393, Cl. 435-4.000.
Chen, Hai C. Computer-controlled password lock. 4,812,841, Cl. 340-825.310.
Chen, Richard Y. S., to Ocular Technologies, Inc. Gas permeable contact lens and method and materials for its manufacture. 4,812,598, Cl. 523-107.000.
Chen, Scott, to Tien Teng Wang. Flexible lamp-string device. 4,812,956, Cl. 362-249.000.
Chen, Tien T.: *See*—
Barnett, Gerald W.; and Chen, Tien T., 4,812,510, Cl. 524-807.000.
Chen, Ziuyun: *See*—
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Cherbuy, Bernard: *See*—
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Cheron, Jacques: *See*—
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Cherry, John A.: *See*—
Johnson, Richard L.; Cherry, John A.; and Pankow, James F., 4,811,599, Cl. 73-155.000.
Chesebrough-Pond's Inc.: *See*—
LaRosa, Joseph P.; and Lombardi, Michael H., 4,811,900, Cl. 239-10.000.
Siuta-Mangano, Patricia, 4,812,307, Cl. 424-71.000.
Chesnut, M. Gaines. Cartridge magazine and method for increasing number of stored cartridges. 4,811,510, Cl. 42-50.000.
Cheung, Kwun-Wing W., to Boeing Company, The. Roll die assembly with misalignment damage protection. 4,811,590, Cl. 72-482.000.
Chevron Research Company: *See*—
Dillier, Justin M.; and Clark, Richard H., 4,811,598, Cl. 73-154.000.

Kamilos, G. N.; Kennedy, D. D.; and Lederhos, L. J., Jr., 4,811,786, Cl. 166-303.000.
Chianelli, Russell R.: *See—*
Jacobson, Allan J.; Ho, Teh C.; Chianelli, Russell R.; Steger, John J.; and Montagna, Angelo A., 4,812,227, Cl. 208-215.000.
Chiba, Katuaki: *See—*
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Chida, Noritaka: *See—*
Yoshioka, Takeo; Chida, Noritaka; Watanabe, Azuma; Fukagawa, Yasuo; and Ishikura, Tomoyuki, 4,812,563, Cl. 540-302.000.
Chida, Yukio; Nishimura, Tetsunhiko; and Oguri, Yasuo, to Mitsubishi Chemical Industries Limited. Piezoelectric bending actuator. 4,812,698, Cl. 310-330.000.
Chih, Liu P.: *See—*
Hwang, Chi Y.; and Chih, Liu P., 4,811,682, Cl. 114-345.000.
Chikatsu, Yoshishige: *See—*
Oshima, Noboru; Chikatsu, Yoshishige; Fukuhori, Toshiaki; Hamada, Tatsuro; and Fujimaki, Tatsuo, 4,812,525, Cl. 525-232.000.
Child, Jonathan E., to Mobil Oil Corporation. NO_x control during multistage combustion. 4,812,430, Cl. 502-42.000.
Child, Jonathan E., to Mobil Oil Corporation. NOx control in fluidized bed combustion. 4,812,431, Cl. 502-42.000.
Chitayat, Anwar. Positioning device with dual linear motor. 4,812,725, Cl. 318-625.000.
Chitose Kagaku Kogyo Co., Ltd.: *See—*
Sekiya, Takashi, 4,811,842, Cl. 206-443.000.
Chiyoda Corporation: *See—*
Inooka, Masayoshi, 4,812,167, Cl. 75-63.000.
Cho, Michio: *See—*
Ushiro, Seimei; Ohmura, Hiroshi; Cho, Michio; Tanaka, Tsutomu; Tanaka, Yasuhiko; Asano, Seiji; and Ohno, Kazunori, 4,812,866, Cl. 354-288.000.
Choi, M. K.: *See—*
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Chretien, Normand: *See—*
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Chretten, Michel J. E., to MacGregor-Navire (F) S.A. Device for at least partly closing a vertical opening in a building and its use as a mechanical anti-freeze shutter. 4,811,777, Cl. 160-201.000.
Christenson, Ronald E., to McNeilus Truck and Manufacturing, Inc. Tag axle assembly with limit switch. 4,812,044, Cl. 366-54.000.
Christian, Klaus; and Gerd, Fuhrer, to Zahnradfabrik Friedrichshafen AG. Dog clutch with locking synchronization. 4,811,825, Cl. 192-53.00F.
Christl, Klaus: *See—*
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Chronsny, Wojciech M.: *See—*
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Chrysler Motors Corporation: *See—*
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Chu, Albert M.; and Griffin, William R., to International Business Machines Corporation. Transistor delay circuits. 4,812,688, Cl. 307-605.000.
Chukoh Chemical Industries, Ltd.: *See—*
Yokoyama, Shigeki; Kamiya, Takeshi; Niikawa, Takeo; Nagase, Masakatsu; and Kuroishi, Tetujiro, 4,812,355, Cl. 428-215.000.
Chung, Paul W.; and Saber, Paik, to International Business Machines Corporation. Temperature stable voltage controlled oscillator with super linear wide frequency range. 4,812,784, Cl. 331-113.00R.
Chung, Tze-Chiang, to Exxon Research & Engineering Co. Polyalcohol homopolymers. 4,812,529, Cl. 525-326.100.
Church & Dwight Co., Inc.: *See—*
Winston, Anthony; Marder, Herman; and Sorenson, Wayne, 4,812,308, Cl. 424-52.000.
Cianciullo, Joseph J.: *See—*
Bankuty, Geza E.; Byron, LeRoy F.; and Cianciullo, Joseph J., 4,811,850, Cl. 209-546.000.
Ciba-Geigy AG: *See—*
Brent, Richard J.; and Moss, Brian F., 4,812,882, Cl. 355-77.000.
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Lehmann, Hans; and Zahir, Abdul-Cader, 4,812,538, Cl. 525-505.000.
Martin, Pierre, 4,812,580, Cl. 548-561.000.
Odorisio, Paul A.; Pastor, Stephen D.; and Hyun, James L., 4,812,501, Cl. 524-117.000.
Tsao, Fu-Pao; and Sills, M. Alicja, 4,812,173, Cl. 134-27.000.
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Griffin, Rodney L.; Ciliberti, David F.; and Lippert, Thomas E., 4,812,149, Cl. 55-71.000.
Cinotti, Andrea, to Wrapmatic S.p.A. Feed apparatus for strip wrapping material, used in conjunction with a wrapping machine of the type wherein the commodity to be enveloped impinges on the wrapping sheet. 4,811,544, Cl. 53-64.000.
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Cipriani, Gioacchino; and Mariano, Armando, to Enichem Sintesi, S.p.A. Oligomer flame-retarding additive, process for its preparation and its use for endowing a linear polyester with self-extinguishing characteristics. 4,812,502, Cl. 524-125.000.
Circle Chemical Company, Inc.: *See—*
Duminy-Kovarik, Isabelle Y., 4,812,249, Cl. 252-62.520.
Citizen Watch Co., Ltd.: *See—*
Kimura, Soosaku; Itoh, Masaya; and Okabe, Takeshi, 4,811,525, Cl. 51-166.0MH.
Citrus Central, Inc.: *See—*
Brock, James E.; and DeUnger, William R., 4,812,172, Cl. 134-22.100.
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Roberts, Eugene, 4,812,447, Cl. 514-170.000.
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Claassen, Henning J. Apparatus for liquefying a thermoplastic plastic. 4,811,863, Cl. 222-146.500.
Clarion Co., Ltd.: *See—*
Sakata, Haruo, 4,812,930, Cl. 360-84.000.
Clark Equipment Company: *See—*
Watts, Verne C.; Loraas, Orlan J.; Kaczmarski, Wally L.; and Asche, James E., 4,811,983, Cl. 296-190.000.
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Clausen, Scott W.: *See—*
Sorenson, Carl C.; and Clausen, Scott W., 4,811,860, Cl. 220-380.000.
Clemens, Gregory. Self-illuminating floral device. 4,812,952, Cl. 362-84.000.
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Clopper, Lawrence A.: *See—*
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Melody, Brian; and Clouse, James A., 4,812,951, Cl. 361-504.000.
Clutterbuck, Richard C. D., to Thorn Emi Electronics Limited. Magnetic sensor arrangement. 4,811,665, Cl. 102-427.000.
Cobb, Carleton M., III; Hirsbrunner, Hans G.; Gonsalves, Edward M.; Jenne, Richard L.; and Nott, Sepideh H., to Texas Instruments Incorporated. Miniature circuit breaker with improved longevity. 4,812,799, Cl. 337-70.000.
Cocherell, Francis E.; Harper, Homer C.; and Hsieh, George. Toothpaste or dental cream composition and method of preparing same. 4,812,306, Cl. 424-52.000.
Cochran, C. Norman; and Brown, Melvin H., to Aluminum Company of America. Process for carbothermic production of alkaline earth metal aluminide and recovery of same. 4,812,168, Cl. 75-68.00A.
Cochran, Gary L.; Seeley, Ronald D.; Shelton, Donald G.; and Stromberg, Gary D., to J. I. Case Company. Implement-coupling assembly for material-handling apparatus. 4,812,103, Cl. 414-723.000.
Codex Corporation: *See—*
Ling, Fuyun, 4,813,073, Cl. 379-410.000.
Coe, Richard J.; and Morse, Margaret S., to Boeing Company, The. Dipole antenna with parasitic elements. 4,812,855, Cl. 343-818.000.
Coenen, Hubert; Hagen, Rainer; and Reimann, Klaus, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Apparatus for separating a solid substance from a liquid mixture of substances. 4,812,233, Cl. 210-177.000.
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Lau, Monica M.; and Coffinberry, George A., 4,811,556, Cl. 60-206.000.
Cohen, Choua: *See—*
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Cohen, Richmond R.; and Gibboni, David J., to Hercules Incorporated. Method and device for control of by-products from cigarette smoke. 4,811,745, Cl. 131-342.000.
Cole, Edward W., III: *See—*
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Coleco Industries, Inc.: *See—*
Hemmann, Ronald S., 4,811,954, Cl. 273-283.000.
Coleman, Donald J., to Eaton Corporation. Dimmer switch. 4,812,603, Cl. 200-570.000.
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Colles, Joseph H., to Brooktree Corporation. Digital-to-analog converter. 4,812,818, Cl. 371-30.000.
Colodner, Jesse L.; and Clopper, Lawrence A., III, to Clopper, Lawrence A. Hexadecimal abacus. 4,812,124, Cl. 434-203.000.
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Comarmond, Jacques; Purcell, Thomas; and Zard, Lydia, to Synthelabo. N-(imidazolylmethyl)diphenylazomethines and compositions containing them. 4,812,467, Cl. 514-341.000.

Combs, John W., to Automated Diagnostic Systems, Inc. Specimen processing system. 4,812,294, Cl. 422-72.000.

Combustion Engineering, Inc.: *See*—
Bresowar, Gerald E., 4,812,295, Cl. 422-169.000.

Comet Trailer Corp.: *See*—
Wiley, James G., Jr., 4,811,972, Cl. 280-683.000.

Cometti, Giuseppe: *See*—
Santi, Roberto; Cometti, Giuseppe; and Pagani, Anselmo, 4,812,592, Cl. 560-180.000.

Comey, David M., to Honeywell Inc. Sharp edge for thick coatings. 4,812,653, Cl. 250-338.100.

Commons, Thomas J.; Mewshaw, Richard E.; and Strike, Donald P., to American Home Products Corporation. Substituted acyloxyalkylphenylethylene inhibitors of 3-hydroxy-3-methylglutaryl-coa reductase. 4,812,583, Cl. 549-292.000.

Compagnie Europeenne de Compasants Electroniques LCC: *See*—
Delalande, Francois; and Bon, Serge, 4,811,914, Cl. 242-56.100.

Compair Power Tools Limited: *See*—
Hall, Raymond J., 4,811,756, Cl. 137-498.000.

Condamin, Bernard: *See*—
Monquin, Felix; and Condamin, Bernard, 4,811,629, Cl. 74-710.500.

Conrad, Thomas W.: *See*—
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Consiglio Nazionale Delle Ricerche: *See*—
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Continental Aktiengesellschaft: *See*—
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Convex Computer Corporation: *See*—
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Cookie Cup International: *See*—
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Cooley, Curtis D.: *See*—
Brandenburg, Bruce L.; Cooley, Curtis D.; and Ellis, Claude E., 4,812,243, Cl. 210-761.000.

Cooper, Robert L. Underground surge irrigation system. 4,812,082, Cl. 405-36.000.

Coplan, Myron J.; and Giglia, Salvatore, to Albany International Corp. Method of manufacturing a hollow filament separatory module with constricted bundle end. 4,812,184, Cl. 156-84.000.

Copley Pharmaceuticals, Inc.: *See*—
Iorio, Theodore L., 4,812,303, Cl. 424-44.000.

Coppens, Wilfried: *See*—
Lievens, Hugo; and Coppens, Wilfried, 4,811,583, Cl. 72-38.000.

Corallo, Valeriano, to Giustina International S.P.A. Cylinder grinding machine with tracing and dimensional and surface checking. 4,811,524, Cl. 51-165.00R.

Cordis Corporation: *See*—
Stevens, Robert C., 4,811,743, Cl. 128-772.000.

Cornell, Jeffrey K., to Microwave Products of America, Inc. Compensation for improved continuous transformer and motor. 4,812,607, Cl. 219-10.55B.

Cornell, Lorne T.; Sisto, Eugene; Ohtola, Victoria L.; and Kenney, Lawrence P., to Eastman Kodak Company. Film belt loader package. 4,811,839, Cl. 206-303.000.

Cornell Research Foundation, Inc.: *See*—
Blackburn, Gary F., 4,812,888, Cl. 357-26.000.

Correll, Ronald E., to Tektronix, Inc. Traveling wave push-pull electron beam deflection structure having voltage gradient compensation. 4,812,707, Cl. 313-435.000.

Corrothers, Robert S., to Cams, Inc. Multi-mode force control circuit. 4,812,722, Cl. 318-561.000.

Corsberg, Daniel R., to United States of America, Energy. Functional relationship-based alarm processing system. 4,812,819, Cl. 340-517.000.

Corti, Aldo; and Falcon, John A., to Gulf Canada Resources Limited; and RTR Oil Sands (Alberta) Ltd. Method and apparatus for treatment of oil contaminated sludge. 4,812,225, Cl. 208-13.000.

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Economides, Apollo P.; Gergely, Stephen; and Walton, Christopher, 4,811,738, Cl. 128-419.0PG.

Covington, Roger G.: *See*—
Carmichael, Even P.; Niedospial, John J.; Covington, Roger G.; and Muller, Bruce R., 4,813,063, Cl. 378-182.000.

Cowan, Michael L.; and Goodman, David C., to Northern Telecom Limited. Selective connection of power supplies. 4,812,672, Cl. 307-64.000.

Cox, William C.; Goetschius, Gary C.; and Casagrande, Mark T., to Air Preheater Company, Inc. Method of detecting hot spots in a rotary heat exchanger. 4,813,003, Cl. 364-557.000.

Cozean, Colette R. D.: *See*—
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Crawford, Carl R.: *See*—
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Crawford, Thomas C.; Keely, Stanley L.; Larson, David L.; Lombardino, Joseph G.; and Maciejko, James J., to Pfizer Inc. Antiinflammatory compositions and methods. 4,812,455, Cl. 514-226.500.

Creekmore, Thomas D. Placement apparatus for lingual and buccal brackets. 4,812,118, Cl. 433-2.000.

Crimmin, Michael J.: *See*—
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Cripe, Jerry D. Simulated desert varnish products and methods of making same. 4,812,340, Cl. 428-15.000.

Crispin, Carl W.: *See*—
Beard, Richard C.; and Crispin, Carl W., 4,812,281, Cl. 264-502.000.

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Crook, Tina; and Crook, Geraldine. Door holder. 4,811,454, Cl. 16-82.000.

Culpepper, Charles F., to Tektronix, Inc. Laser driver. 4,813,045, Cl. 372-38.000.

Cummings, Larry E. Tuning mechanism for stringed instrument. 4,811,645, Cl. 84-207.000.

Cummings, Lowell O., to Adhesive Coatings Co. Dual cure rate water-based coating compositions. 4,812,493, Cl. 523-412.000.

Cunningham, William D., to Atlanta Cutlery Corporation. Pocket knife. 4,811,486, Cl. 30-161.000.

Cuppen, Johannes J. M.: *See*—
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Currier, Frederick A.; and Herb, Carl C., to Carrier Corporation. Sound insulated bellows-type air terminal valve. 4,811,575, Cl. 98-41.100.

Curtis Dyna-Products Corporation: *See*—
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Curtis, Huntington W.; Fung, Min-Su; and Verkuil, Roger L., to International Business Machines Corporation. Contactless technique for semicondutor wafer testing. 4,812,756, Cl. 324-158.00R.

Cutburth, Ronald W., to United States of America, Energy. Motorized control for mirror mount apparatus. 4,811,619, Cl. 74-424.80B.

Cutler, David N.: *See*—
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Cyborg Systems, Inc.: *See*—
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D. H. Haden Limited: *See*—
Haden, John D.; and Duxbury, Eric, 4,812,623, Cl. 219-437.000.

Dackus, Arnold J. G.; and Brasser, Cornelis G. J., to Rijnstaal B.V. Method and apparatus for the manufacture of powder-filled steel tube from steel strip. 4,811,889, Cl. 228-148.000.

Dahlman, Sten, to Industrimekanik I Stockholm AB. Portable drive means supported on a skier. 4,811,669, Cl. 105-30.000.

Daikin Industries, Ltd.: *See*—
Okochi, Kastuhiko; Toya, Mitsuo; Naito, Masahito; Inoue, Yoshiaki; and Egusa, Takahiro, 4,812,997, Cl. 364-505.000.
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Daimler-Benz Aktiengesellschaft: *See*—
Buhl, Horst; Kleinekathofer, Wolfgang; and Tank, Eggert, 4,811,701, Cl. 123-188.0AA.
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Dainippon Screen Mfg. Co., Ltd.: *See*—
Iwamoto, Hiroshi; Tamura, Yutaka; Mizuno, Yuji; and Yokota, Akihiro, 4,812,916, Cl. 358-289.000.
Nishizawa, Hisao, 4,811,443, Cl. 15-97.100.

Daiwa Seiko, Inc.: *See*—
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Dale, James L.; Mannen, Bryce L.; and Titsworth, Raymond, to FMC Corporation. Tire Changer safety arm. 4,811,774, Cl. 157-1.100.

Dallas, Stanley A., Jr., to Thales Resources, Inc. Method of using a waveform to sound pattern converter. 4,812,746, Cl. 324-121.00R.

Dalton, Arthur W.: *See*—
Rolfe, John A.; Dalton, Arthur W.; and Silvester, Robert, 4,812,958, Cl. 362-431.000.

Dambach, Philip J.; and Brown, Ray, to Molex Incorporated. Optic sensing assembly. 4,812,003, Cl. 350-96.180.

D'Amico, Carl: *See*—
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Danby, Clive M.: *See*—
Jones, Gregory D.; Owens, William R.; Thiel, Clifford G.; and Danby, Clive M., 4,812,943, Cl. 361-92.000.

D'Aquino, Anthony A. Self-propelled fishing device. 4,811,515, Cl. 43-26.100.

Darden, Bruce V.: *See*—
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Davarian, Faramaz; and Sumida, Joe T., to California Institute of Technology. Method and system for providing precise multi-function modulation. 4,812,786, Cl. 332-16.00R.

Davidson, Charles F.; Shirts, Monte B.; and Harbuck, Donna D., to United States of America, Interior. Production of titanium nitride, carbide, and carbonitride powders. 4,812,301, Cl. 423-440.000.

Davis, Glen: *See*—
Keel, Jerry L.; Hines, Thomas M.; Davis, Glen; and Parks, William E., 4,812,750, Cl. 324-158.00P.
Davis, Jesse F.; and Prevost, John C. Vehicle motion indicator. 4,812,807, Cl. 340-464.000.
Davis, Larry: *See*—
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Helsley, Grover C.; Davis, Larry, and Olsen, Gordon E., 4,812,456, Cl. 514-225.500.
Davis, Lori J. Substitute for oral smokeless tobacco and method of making the same. 4,811,746, Cl. 131-359.000.
Davis, Russell G. Hoop for stretching animal pelts. 4,811,576, Cl. 69-19.300.
Davison, Andrew J.: *See*—
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Dayco Products, Inc.: *See*—
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Dean, Malcolm; and Withers, Kenneth L, to Massey-Ferguson Services N.V. Seed drill. 4,811,795, Cl. 172-456.000.
Debe, Mark K., to Minnesota Mining and Manufacturing Company. Article having surface layer of uniformly oriented, crystalline, organic microstructures. 4,812,352, Cl. 428-142.000.
DeBell, Lawrence R., to Phi Technologies, Inc. Digital audio memory system. 4,813,014, Cl. 365-45.000.
De Bernardini, Carlo. Hand fire-arm for shooting without ammunition. 4,811,955, Cl. 273-310.000.
Debuyascher, Pierre L.; Bauwens, Jan G.; and DeSomer, Michel P. M., to Alcatel NV. Switching system. 4,813,037, Cl. 370-60.000.
Deere & Company: *See*—
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de Fraine, Paul J.: *See*—
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Degnan, Thomas F., Jr.: *See*—
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Degussa Aktiengesellschaft: *See*—
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Stober, Reinhard; Fischer, Wolfgang; Huss, Michael; and Udluft, Klaus, 4,812,257, Cl. 252-182.320.
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Dejneka, Tamara: *See*—
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Delalande, Francois; and Bon, Serge, to Compagnie Europeenne de Compasants Electroniques LCC. Winding wheel for high-temperature baking of stacked capacitors. 4,811,914, Cl. 242-56.100.
Della Bella, Davide: *See*—
Ferrrari, Vittorio; Carenzi, Angelo; and Della Bella, Davide, 4,812,477, Cl. 514-513.000.
Delta Systems, Inc.: *See*—
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De Luca, Paul V., to Porta Systems Corp. Laminar type telephone connector block. 4,813,071, Cl. 379-327.000.
Delvaux, Pierre; and Lesmerises, Normand, to Ceram-Sna, Inc. Process for obtaining boric acid treated asbestos fiber. 4,812,204, Cl. 162-3.000.
DeMaria, Anthony J.; and Bridges, William, to United States of America, Air Force. Dielectric ridge waveguide gas laser apparatus. 4,813,052, Cl. 372-64.000.
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Bugner, Douglas E.; Alexandrovich, Peter S.; DeMejo, Lawrence P.; and Guistina, Robert A., 4,812,381, Cl. 430-110.000.
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Den Boef, Johannes H., to U.S. Philips Corp. Fast method and device for determining an NMR distribution in a region of a body. 4,812,762, Cl. 324-309.000.
Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
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Takagi, Touichi; Ametani, Kohei; and Shimizu, Kouichi, 4,812,426, Cl. 501-136.000.
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Dervan, Andrew H.; and Kordomenos, Panagiotis I., to Du Pont de Nemours, E. I., and Company. Coating composition containing a hydroxy functional epoxy-polyester graft copolymer. 4,812,535, Cl. 525-450.000.
DeSimone, Richard E.; and Lane, Lori B., to Amoco Corporation. Selective para-ethylation of toluene with magnesium compound-impregnated, crystalline, gallosilicate based, molecular sieve catalyst compositions. 4,812,536, Cl. 585-467.000.
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Detis Freyberg GmbH: *See*—
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DeUnger, William R.: *See*—
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Deutsche ITT Industries GmbH: *See*—
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Deyle, William J., Jr.; and Wysocky, John M., to Xerox Corporation. Particle anti-bridging apparatus. 4,811,867, Cl. 222-231.000.
Diafoil Company, Limited: *See*—
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Dietrich, Klaus; and Harasim, Anton, to Messerschmitt-Boelkow-Blohm GmbH. Method for producing the first differential of a two-dimensional image and optical structural element for performing the method. 4,812,019, Cl. 350-355.000.
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Doering, Roger W., 4,812,830, Cl. 340-712.000.
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Butts, H. Bruce, Jr.; Cutler, David N.; Schnorr, Peter C.; and Short, Robert T., 4,812,971, Cl. 364-200.000.
Ho, Chung W.; and Min, B. Y., 4,812,191, Cl. 156-239.000.
Yang, Ji L.; and Melanson, Ronald J., 4,812,676, Cl. 307-290.000.
Digital Marine Electronics Corporation: *See*—
Giubardo, Mark J., 4,812,851, Cl. 342-389.000.
Dillier, Justin M.; and Clark, Richard H., to Chevron Research Company. Downhole temperature measurements. 4,811,598, Cl. 73-154.000.
Dillner, James M.; and Saint, Nathanael, to Graco Metal Products, Inc. Foldable playyard. 4,811,437, Cl. 5-99.00B.
Dimond, James; and Swackhammer, William, to Harco Technologies Corporation. Apparatus for cathodically protecting reinforcing members and method for installing same. 4,812,212, Cl. 204-147.000.
Disbrow, Richard A.; and Blanchard, Russel O., to Invacare Corp. Unobstructed adjustable V-frame exercycle. 4,811,945, Cl. 272-73.000.
DiSimone, Robert P. Portable automotive bench. 4,811,875, Cl. 224-42.440.
Dixon, Allen L. Paint roller cleaning device. 4,811,749, Cl. 134-184.000.
Djordjevic, Ilija; Kelly, William W.; and Vanderpoel, Richard E., to Stanadyne, Inc. Electronic unit injector. 4,811,715, Cl. 123-447.000.
Dobkin, Robert C.: *See*—
Essaff, Robert; and Dobkin, Robert C., 4,812,961, Cl. 363-61.000.
Dockrey, J. William: *See*—
Pfiester, James R.; Parrillo, Louis C.; and Dockrey, J. William, 4,812,418, Cl. 437-069.000.
Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Gruden, Dusan, 4,811,708, Cl. 123-299.000.
Hempel, Ulrich, 4,811,984, Cl. 296-97.220.
Peter, Dietmar; and Poppele, Gebhard, 4,811,979, Cl. 293-102.000.
Dr. Ing. Rudolf Hell GmbH: *See*—
Knop, Hans-Georg; and Schulz-Hennig, Jorg, 4,812,913, Cl. 358-285.000.
Doering, Roger W., to Digital Electronics Corporation. Touch panel display assembly. 4,812,830, Cl. 340-712.000.
Dogahara, Takashi: *See*—
Shimada, Makoto; and Dogahara, Takashi, 4,811,713, Cl. 123-399.000.
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Dolbeare, Frank A.; and Gray, Joe W., to University of California. Flow cytomeric measurement of DNA and incorporated nucleoside analogs. 4,812,394, Cl. 435-6.000.

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Domenichiello, Peter. Balloon container for flowers and machine for making same. 4,811,841, Cl. 206-423.000.

Domtar Gypsum Inc.: *See*—
Rivers, Jerry B., 4,812,045, Cl. 366-107.000.

D'Onofrio, Anthony, to Honeywell Inc. Method and apparatus for providing autoranging for an AC/DC power management circuit for DC solenoid actuators. 4,812,945, Cl. 361-154.000.

Donzi Marine Corporation: *See*—
Genth, Richard E., 4,811,680, Cl. 114-201.00R.

Dorcich, Dan D.: *See*—
Slonimsky, Leonid; and Dorcich, Dan D., 4,811,927, Cl. 249-210.000.

Dorel Industries Inc.: *See*—
Schwartz, Leo, 4,811,436, Cl. 5-93.00R.

Dorsey-Zinn, Denise; Meiser, Sue M.; and Cassidy, Michael F., to Random House, Inc. Puzzle including pieces formed from a crayon material. 4,811,951, Cl. 273-157.00R.

Douglas-Hamilton, D. H.; and Ruffell, John P., to Eaton Corporation. Calorimetric dose monitor for ion implantation equipment. 4,812,663, Cl. 250-492.20R.

Dow Chemical Company, The: *See*—
Burba, John L., III; and Bauman, William C., 4,812,245, Cl. 252-17.000.
Cadotte, John E.; and Schmidt, Donald L., 4,812,238, Cl. 210-636.000.
Leadbetter, Arthur N.; and Galloway, James G., 4,812,496, Cl. 524-47.000.
Priddy, Duane B.; and Schroeder, John R., 4,812,514, Cl. 525-67.000.
Priddy, Duane B.; and Letton, Alan, 4,812,530, Cl. 525-409.000.
Schrock, Alan K., 4,812,588, Cl. 556-453.000.
Treybig, Duane S., 4,812,531, Cl. 525-419.000.
Woods, Timothy R.; and Behr, R. Douglas, 4,812,192, Cl. 156-251.000.
Zieke, Larry M., 4,812,056, Cl. 383-65.000.

Dow Corning Corporation: *See*—
Kemp, Daniel N., 4,812,115, Cl. 425-405.200.

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Kanahara, Naoyuki; Furo, Masahiro; and Furihata, Tetsuo, 4,811,893, Cl. 228-198.000.

Dowling, Charles; and Raymond, Roger S., to Rockwell International Corporation. Method of eliminating core distortion in diffusion bonded and superplastically formed structures. 4,811,890, Cl. 228-157.000.

Doyle, Walter M., to Laser Precision Corporation. Spectrometer system having pivotally mounted internal reflectance element. 4,812,041, Cl. 356-346.000.

Drabek, Josef: *See*—
Boger, Manfred; and Drabek, Josef, 4,812,468, Cl. 514-346.000.

Drabek, Jozef: *See*—
Boger, Manfred; and Drabek, Jozef, 4,812,466, Cl. 514-351.000.

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Hartung, Karl-Heinz, 4,811,732, Cl. 128-204.260.

Dravkin, David, to Israel Aircraft Industries Ltd. Saturable reactor current pulse generator. 4,812,770, Cl. 328-67.000.

Drejer, Jorgen: *See*—
Honore, Tage; Drejer, Jorgen; Jacobsen, Poul; and Nielsen, Flemming E., 4,812,458, Cl. 514-249.000.

Drent, Eit: *See*—
Sie, Swan T.; Drent, Eit; and Jager, Willem W., 4,812,433, Cl. 502-117.000.

Driscoll, Carleton D.; Najm, Elie M.; and Waechter, Manfred, to International Business Machines Corp. Synchronization circuit for a blocking oscillator. 4,812,959, Cl. 363-20.000.

Dubost, Bruno. Method of heat treatment of Al-based alloys containing Li and the product obtained by the method. 4,812,178, Cl. 148-12.70A.

Dudasik, Edward M., to Transaction Technology Inc. Privacy screen for a color cathode ray display tube. 4,812,709, Cl. 313-478.000.

Duetsche Forchungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See*—
Heinrich, Jurgen; and Bohmer, Manfred, 4,812,272, Cl. 264-65.000.

Duggan, John A.; and Gombas, Robert P., to Universal-Rundle Corporation. Shower door assembly. 4,811,520, Cl. 49-409.000.

Duminy-Kovarik, Isabelle Y., to Circle Chemical Company, Inc. Testing system. 4,812,249, Cl. 252-62.520.

Duncan, Thomas F.; and Kline, Regis F., to Borden Inc. Viscosity adjustment of ammoniated urea-formaldehyde resin compositions by addition of dried urea-formaldehyde powder. 4,812,366, Cl. 428-528.000.

Dunn, Robert M., to Cadware Group, Ltd., The. Schematic diagram generating system using library of general purpose interactively selectable graphic primitives to create special applications icons. 4,813,013, Cl. 364-900.000.

Dupaillon, Jacques: *See*—
Prigent, Georges; Besnard, Patrick; and Dupaillon, Jacques, 4,812,946, Cl. 361-150.000.

Du Pont de Nemours, E. I., and Company: *See*—
Ballas, Robert A.; and Frey, William A., 4,812,395, Cl. 435-7.000.
Ballas, Robert A.; and Frey, William A., 4,812,396, Cl. 435-7.000.
Dervan, Andrew H.; and Kordomenos, Panagiotis I., 4,812,535, Cl. 525-450.000.
Fountain, Frank S.; Pusey, Donald K.; and McCloy, Keith A., 4,812,923, Cl. 360-25.000.
Merchant, Abid N.; Burke, Kenneth C.; and Redenbaugh, Jill M., 4,812,256, Cl. 252-162.000.
West, Michael W. J., 4,812,517, Cl. 525-94.000.

Durafilm Corporation: *See*—
Jamison, Warren E., 4,811,818, Cl. 184-3.200.

Durant, Graham J.; Gribble, Andrew D.; and Slater, Robert A., to SmithKline & French Laboratories, Ltd. Pharmaceutically active compounds. 4,812,573, Cl. 514-307.000.

Duriron Company, Inc., The: *See*—
Helferich, Richard L.; and Schenck, Robert C., 4,812,424, Cl. 501-84.000.

Duthoit, Francois, to Thomson-CSF. Method for measuring and correcting the induced magnetization in a nautical vessel. 4,812,759, Cl. 324-226.000.

Duthuit, Olivier; Bonnet, Thierry; and Martin, Philippe, to U.S. Philips Corporation. Processor for the elimination of concealed faces for the synthesis of images in three dimensions. 4,812,988, Cl. 364-522.000.

Duxbury, Eric: *See*—
Haden, John D.; and Duxbury, Eric, 4,812,623, Cl. 219-437.000.

Dvorsky, James E., to Battelle Memorial Institute. Topography sensor. 4,811,594, Cl. 73-105.000.

Dyson-Kissner-Moran Corporation, The: *See*—
Bianco, Andrew S., 4,811,870, Cl. 222-461.000.

Dzik, Stanley J. Flight destination board game. 4,811,952, Cl. 273-258.000.

E. I Du Pont De Nemours and Company: *See*—
Gilmer, Thomas C.; and Chang, David C. K., 4,812,506, Cl. 524-512.000.

E. J. Brooks Company: *See*—
Swift, Allan W.; and Venable, Frank, 4,811,977, Cl. 292-307.00A.

E. R. Squibb & Sons, Inc.: *See*—
Slusarchyk, William A.; and Dejneka, Tamara, 4,812,564, Cl. 540-355.000.

Eagle-Picher Industries, Inc.: *See*—
Markle, Richard A., 4,812,521, Cl. 525-116.000.

Earth Chemical Co., Ltd.: *See*—
Kuwano, Eiichi; Takeya, Ryuko; Eto, Morifusa; and Asano, Shoji, 4,812,473, Cl. 514-396.000.

Eastman Kodak Company: *See*—
Babb, Bruce E.; Belly, Robert T.; and Scensny, Patricia M., 4,812,409, Cl. 435-7.000.
Blakely, Dale M., 4,812,534, Cl. 525-425.000.
Bugner, Douglas E.; Alexandrovich, Peter S.; DeMejo, Lawrence P.; Guistina, Robert A.; and Anderson, James H., 4,812,378, Cl. 430-110.000.
Bugner, Douglas E.; and Alexandrovich, Peter S., 4,812,380, Cl. 430-110.000.
Bugner, Douglas E.; Alexandrovich, Peter S.; DeMejo, Lawrence P.; and Guistina, Robert A., 4,812,381, Cl. 430-110.000.
Bugner, Douglas E.; and Alexandrovich, Peter S., 4,812,382, Cl. 430-110.000.
Carmichael, Even P.; Niedospial, John J.; Covington, Roger G.; and Muller, Bruce R., 4,813,063, Cl. 378-182.000.
Cornell, Lorne T.; Sisto, Eugene; Ohtola, Victoria L.; and Kenney, Lawrence P., 4,811,839, Cl. 206-303.000.
Desormeaux, Stephen G. M., 4,812,872, Cl. 354-414.000.
Goswami, Ramanuj; and Chen, Chin H., 4,812,393, Cl. 435-4.000.
Hatakeyama, Atsushi; Izumi, Masaki; and Ohmori, Seishi, 4,812,064, Cl. 400-622.000.
Mauck, John C.; Mauck, Linda A.; and Norton, Gary E., 4,812,399, Cl. 435-18.000.
Pan, Kee-Chuan; Tyan, Yuan-Sheng; and Preuss, Donald R., 4,812,385, Cl. 430-290.000.
Pan, Kee-Chuan; Tyan, Yuan-Sheng; and Marino, Salvatore J., 4,812,386, Cl. 430-290.000.
Prince, Eric T., 4,811,687, Cl. 118-666.000.
Sand, I. Daniel, 4,812,495, Cl. 524-37.000.
Stavinoha, Jerome L.; and McCollum, Anthony W., 4,812,509, Cl. 524-484.000.
Warren, Harold C., III; and Snyder, Brian A., 4,812,414, Cl. 436-533.000.
Wilson, John C.; Santilli, Domenic; and DeMejo, Lawrence P., 4,812,377, Cl. 430-109.000.

Eaton Corporation: *See*—
Coleman, Donald J., 4,812,603, Cl. 200-570.000.
Douglas-Hamilton, D. H.; and Ruffell, John P., 4,812,663, Cl. 250-492.20R.
Gale, Allan R.; and Hoppie, Lyle O., 4,812,747, Cl. 324-132.000.
Smith, Jackson H., 4,812,605, Cl. 200-284.000.

Eberhard, Gunter: *See*—
Bebermeier, Jurgen; Fischer, Werner; Heitzig, Jurgen; and Eberhard, Gunter, 4,811,934, Cl. 267-140.100.

Eberhard, Koch U.; and Bodo, Boettcher, to Raychem GmbH. Electrical equipment. 4,812,944, Cl. 361-127.000.

Ebina, Osamu; and Ono, Seigo, to Hitachi, Ltd. Three-dimensional display device and method for pointing displayed three-dimensional image. 4,812,829, Cl. 340-709.000.

Eckert, Dieter; Henseler, Wolfgang; and Luetze, Hans, to Daimler-Benz Aktiengesellschaft. Vehicle door or body section, especially for a passenger motor vehicle. 4,811,517, Cl. 49-145.000.

Eckes, Helmut; Winter, Rainer; and Munkel, Albert, to Hoechst Aktiengesellschaft. Aqueous pigment preparation, and the use thereof. 4,812,492, Cl. 523-351.000.

Eckstein, James N.; Webb, Christopher; and Weng, Shang-Lin, to Varian Associates, Inc. Growth rate monitor for molecular beam epitaxy. 4,812,650, Cl. 250-307.000.

Eckstein, Udo, to Bayer Aktiengesellschaft. Chromogenic phthalides. 4,812,569, Cl. 546-94.000.

Economides, Apollo P.; Gergely, Stephen; and Walton, Christopher, to Coventry City Council. Cardiac pacemaker circuit with fast stored charge reduction. 4,811,738, Cl. 128-419.0PG.

Eden, James; Trksak, Ralph; and Williams, Robert, to National Starch and Chemical Corporation. Starch based encapsulation process. 4,812,445, Cl. 514-60.000.

Edwards, Anne M.: *See*—
Woods, Daniel E.; Gocht, Ronald E.; Higgins, Peter M.; Edwards, Anne M.; Rowlands, Hugh; Scanlon, Edward F.; and Putzer, Jerry, 4,813,077, Cl. 382-7.000.

Edwards, Floyd V.: *See*—
Boehmer, Dennis A.; and Edwards, Floyd V., 4,811,704, Cl. 123-188.00P.

Edwards, Jathan D.: *See*—
Vogelgesang, Peter J.; Ulseth, John W.; Giorgini, Norman L.; and Edwards, Jathan D., 4,812,633, Cl. 235-487.000.

Edwards, Thomas L.; El-Ibiary, Yehia M.; Gunda, Rajamouli; Leemhuis, Richard S.; Phillips, Fred H.; and Rode, Melvin A., to Vickers, Incorporated. Power transmission. 4,811,561, Cl. 60-368.000.

Effland, Richard C.; Davis, Larry; and Kapples, Kevin J., to Hoechst-Roussel Pharmaceuticals Inc. Spiro((piperidine-pyrrolidine- or hexahydroazepinyl substituted) pyrrolo(2,1-C) (1,4)benzoxazepines). 4,812,450, Cl. 514-211.000.

Egle, Wilhelm; Ottensmeyer, F. Peter; and Rilk, Albrecht, to Carl-Zeiss Stiftung. Imaging method and apparatus for electron microscopes. 4,812,652, Cl. 250-311.000.

Egler, Walter, to Robert Bosch GmbH. Apparatus for generating pre-injections in unit fuel injectors. 4,811,899, Cl. 239-5.000.

Egusa, Takahiro: *See*—
Okochi, Kastuhiko; Toya, Mitsuo; Naito, Masahito; Inoue, Yoshiaki; and Egusa, Takahiro, 4,812,997, Cl. 364-505.000.

Ehrenfreund, Josef: *See*—
Farooq, Saleem; Ehrenfreund, Josef; and Waespe, Hans-Rudolf, 4,812,464, Cl. 514-333.000.

Ehret, Reiner: *See*—
Friemel, Wolfgang; Barth, Volker; Munzel, Martin; and Ehret, Reiner, 4,812,291, Cl. 422-28.000.

Ehrsam, Christian, to Sulzer Brothers Limited. Metal microfilter. 4,812,236, Cl. 210-490.000.

Eiden, Gunter: *See*—
Hoffmann, Karl-Ludwig; Eiden, Gunter; and Morach, Eugen, 4,812,267, Cl. 264-169.000.

Eilertsen, John L., to G. & E. Engineering Ltd. Solenoid actuators. 4,812,690, Cl. 310-27.000.

Eke, Kenneth I., to Microwave Ovens Limited. Microwave ovens for cooking primarily meat items. 4,812,606, Cl. 219-10.55B.

Electro-Mechanics, Inc.: *See*—
Gryk, Leon, 4,812,778, Cl. 330-51.000.

Electronique Serge Dassault: *See*—
Pailler, Alain L., 4,812,060, Cl. 400-82.000.

Elias, Harry: *See*—
Wolff, Erich; Lowski, Dieter; and Elias, Harry, 4,812,576, Cl. 548-362.000.

El-Ibiary, Yehia M.: *See*—
Edwards, Thomas L.; El-Ibiary, Yehia M.; Gunda, Rajamouli; Leemhuis, Richard S.; Phillips, Fred H.; and Rode, Melvin A., 4,811,561, Cl. 60-368.000.

Elliott, William, to Magnadyne Corporation. Indicating light. 4,812,814, Cl. 340-332.000.

Elliott, William O., to McConway & Torley Corporation. Knuckle structure to ensure failure at knuckle throat portion. 4,811,854, Cl. 213-155.000.

Ellis, Claude E.: *See*—
Brandenburg, Bruce L.; Cooley, Curtis D.; and Ellis, Claude E., 4,812,243, Cl. 210-761.000.

Ellis, Donald G.: *See*—
Moulding, Thomas S., Jr.; and Ellis, Donald G., 4,811,844, Cl. 206-459.000.

Ellis, Ronald W.; Keller, Paul M.; Lowe, Robert S.; and Davison, Andrew J., to Merck & Co., Inc. Vaccine against varicella-zoster virus. 4,812,559, Cl. 536-27.000.

Ells, John W., to British Petroleum Company p.l.c., The. Pressure device. 4,811,652, Cl. 92-92.000.

Elo, Vesa. Skating device. 4,811,941, Cl. 272-70.000.

Elta Electronics Industry Limited: *See*—
Negev, Michael, 4,812,853, Cl. 343-700.0MS.

ELTECH Systems Corporation: *See*—
Walker, Joseph K., Jr., 4,812,425, Cl. 501-96.000.

Eltinger, Walter: *See*—
Benz, Willi; and Eltinger, Walter, 4,811,586, Cl. 72-165.000.

Emanuelsen, Karl J., to Trio Industrier A/S. Improvement in gutting machines for fish. 4,811,460, Cl. 17-51.000.

Emergency One, Inc.: *See*—
Ewers, Ronald L.; and McCombs, William F., 4,811,804, Cl. 180-53.800.

Emerson Electric Co.: *See*—
Gress, Paul W.; and Wesebaum, Paul E., 4,811,639, Cl. 82-110.000.
Henderson, William R., 4,811,616, Cl. 74-421.00A.
Honkomp, Glenn A.; and Burrows, Larry G., 4,811,831, Cl. 198-394.000.
Tomiser, Frank J., Jr., 4,811,623, Cl. 74-547.000.

Emhart Industries, Inc.: *See*—
Piacenti, Frank; and Ferrante, Pat, 4,812,095, Cl. 411-188.000.

EMI Limited: *See*—
Humphries, John R., 4,812,170, Cl. 106-122.000.

Emrich, Robert K., to ESCO Corporation. Excavating tooth assembly. 4,811,505, Cl. 37-142.00R.

Emsmann, Wulf: *See*—
Braun, Wolfgang; Emsmann, Wulf; Konrath, Karl; Krieger, Klaus; and Nothdurft, Heinz, 4,811,709, Cl. 123-357.000.

Endo, Hiroshi; and Gotoh, Toshihiro, to Mitsubishi Yuka Badische Co., Ltd. Process for producing expanded particles of styrene-acrylonitrile-butadiene copolymer. 4,812,484, Cl. 521-60.000.

Endo, Kazuyuki; Taniguchi, Motoaki; Yamada, Shigeki; Takahashi, Masanobu; and Kato, Kenshiro, to Bridgestone Corporation. Heavy duty pneumatic radial tires. 4,811,773, Cl. 152-543.000.

Endo, Kiyonobu, to Canon Kabushiki Kaisha. Optical information recording and reproducing apparatus. 4,812,020, Cl. 350-409.000.

Endo, Masayuki: *See*—
Ogawa, Kazufumi; Sasago, Masaru; Endo, Masayuki; and Ishihara, Takeshi, 4,812,880, Cl. 355-53.000.

Engelbach, Karl L., to Weyel KG. Wedge connection assemblage. 4,811,508, Cl. 40-607.000.

English Glass Company Limited, The: *See*—
Wass, Anthony; and Law, Brian, 4,811,871, Cl. 222-477.000.

Engstrom, Randy J.: *See*—
Heggart, Ronald G.; McClintock, Willard K.; and Engstrom, Randy J., 4,813,055, Cl. 373-74.000.

Enichem Sintesi S.p.A.: *See*—
Cipriani, Gioacchino; and Landoni, Gianluigi, 4,812,499, Cl. 524-96.000.
Cipriani, Gioacchino; and Mariano, Armando, 4,812,502, Cl. 524-125.000.
Renzi, Fiorenzo; Rivetti, Franco; Romano, Ugo; and Gagliardi, Claudio, 4,812,545, Cl. 526-230.500.

Enter Computer, Inc.: *See*—
Murray, Richard A., 4,812,858, Cl. 346-139.00R.

Epstein, Alan H.; Guenette, Gerald R.; and Norton, Robert J. G., to United States of America, Navy. Method for calibrating a heat flux gauge. 4,812,050, Cl. 374-1.000.

ER Fluid Developments Limited: *See*—
Stangroom, James E., 4,812,251, Cl. 252-75.000.

Erca Holding: *See*—
Hautemont, Jean-Claude, 4,811,550, Cl. 53-478.000.

Erez Forensic Technology, Ltd.: *See*—
Glattstein, Baruch; and Aserin, Abraham, 4,812,413, Cl. 436-92.000.

Erich, Otis G., Jr.; and Fillippone, Walter R., to Union Oil Company of California. Geophone apparatus and a seismic exploration method. 4,813,029, Cl. 367-188.000.

Erickson, David E.; and Reed, Thomas F., to GenCorp Inc. Preparation of latices. 4,812,550, Cl. 527-201.000.

Ermacora, Rino; and Neuerburg, Horst, to Kuhn, S.A. Rotary mower in which the rotary cutting elements are driven by transmission means located under the rotary cutting elements. 4,811,553, Cl. 56-13.600.

ESCO Corporation: *See*—
Emrich, Robert K., 4,811,505, Cl. 37-142.00R.

Escorp, Inc.: *See*—
Harbers, Jr., H. C., 4,812,630, Cl. 235-448.000.

Especialidades Latinas Medicamentos Universales, S.A. (Elmu, S.A.): *See*—
Montoro, Fernando; Calatayud, Jose; and Luna, Manuel, 4,812,482, Cl. 514-649.000.

Essaff, Robert; and Dobkin, Robert C., to Linear Technology, Inc. Charge pump circuitry having low saturation voltage and current-limited switch. 4,812,961, Cl. 363-61.000.

Essert, Robert D.: *See*—
Osborn, Glenn M.; and Essert, Robert D., 4,812,006, Cl. 350-96.210.

Essex Group, Inc.: *See*—
Graham, Randall C.; Smith, James D., Jr.; and Smith, Jeffrey S., 4,812,721, Cl. 318-66.000.

Essex Industries, Inc.: *See*—
Lyons, Jerry L.; and Tayon, Keith, 4,811,752, Cl. 137-77.000.

Estaque, Michel, to Labavia S.G.E. Armature rotors of electromagnetic brakes. 4,811,822, Cl. 188-264.00A.

Estavoyer, Jacques: *See*—
Raulin, Philippe; Messer, Jean-Pierre; Cherbuy, Bernard; and Estavoyer, Jacques, 4,811,476, Cl. 29-603.000.

Etak, Inc.: *See*—
Phillips, Alan C.; and O'Brien, Terence J., 4,811,491, Cl. 33-366.000.
Phillips, Alan C.; O'Brien, Terence J.; and Taylor, Charles S., 4,811,613, Cl. 74-5.60D.

Etemad, Shahrokh; Yannascoli, Donald; and Hatzikazakis, Michael, to Carrier Corporation. Method of assembling scroll compressors. 4,811,471, Cl. 29-156.40R.

Ethicon, Inc.: *See*—
Murray, Michael A., 4,811,886, Cl. 227-19.000.

Ethridge, Edwin C.; and Johnson, Jerry L., to Smock Right, Inc. Self-stripping pleating apparatus. 4,811,873, Cl. 223-32.000.

Etienne, Abel. Retention stocking for lower limb. 4,811,727, Cl. 128-80.00R.

Eto, Morifusa: *See*—
Kuwano, Eiichi; Takeya, Ryuko; Eto, Morifusa; and Asano, Shoji, 4,812,473, Cl. 514-396.000.

ETS. Rivard S.A.: *See*—
Rivard, Daniel, 4,812,078, Cl. 405-179.000.

Etzion, Raphael, to Variety Accessories, Inc. Flower-like ornament. 4,812,341, Cl. 428-24.000.
Eubanks, Hubert M. Vehicle hitch. 4,811,965, Cl. 280-455.100.
Eurand Italia S.p.A.: *See*—
Rossi, Piergiorgio; and Calanchi, Massimo, 4,812,316, Cl. 424-468.000.
Evans, Ben E.: *See*—
Boger, Joshua S.; Evans, Ben E.; and Bock, Mark G., 4,812,442, Cl. 514-18.000.
Evans, John M.; Stemp, Geoffrey; and Cassidy, Frederick, to Beecham Group p.l.c. Anti-hypertensive pyranopyridine compounds. 4,812,459, Cl. 514-254.000.
Evans, Tony. Camouflage eyeglasses. 4,812,031, Cl. 351-46.000.
Everson, Richard W. Track broom bristle. 4,811,447, Cl. 15-159.00A.
Ewers, Ronald L.; and McCombs, William F., to Emergency One, Inc. Fire truck with rear-mounted engine. 4,811,804, Cl. 180-53.800.
Exel Microelectronics Incorporated: *See*—
Goetting, Erich, 4,812,675, Cl. 307-443.000.
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Baird, William C., Jr., 4,812,435, Cl. 502-227.000.
Chung, Tze-Chiang, 4,812,529, Cl. 525-326.100.
Jacobson, Allan J.; Ho, Teh C.; Chianelli, Russell R.; Steger, John J.; and Montagna, Angelo A., 4,812,227, Cl. 208-215.000.
Eyerly, Jon V., to J V Industries, Inc. Portable platform. 4,811,530, Cl. 52-6.000.
Fabbrica D'Armi P. Beretta S.p.A.: *See*—
Beretta, Pier G., 4,811,509, Cl. 42-42.010.
Beretta, Pier G., 4,811,511, Cl. 42-70.060.
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Barcella, Santino; Befeld, Manfred; Faber, Guy; and Slepcevic, Paul, 4,812,107, Cl. 416-191.000.
FAG Kugelfischer Georg Schafer (KGaA): *See*—
Hofmann, Heinrich; and Troster, Manfred, 4,812,058, Cl. 384-563.000.
Fahner, Karsten; Johannaber, Friedrich; Depcik, Hans-Werner; Kaminski, Axel; and Van Hooren, Rudiger, to Bayer Aktiengesellschaft. Plastics moulding containing reinforced fillings. 4,812,247, Cl. 252-511.000.
Falcon, John A.: *See*—
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Falgout, Thomas E., Sr. Power tong improvement. 4,811,635, Cl. 81-57.330.
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Fang, Hongaheng; Zhao, Rufa; Zheng, Yankang; Chen, Ziuyun; He, Guangchu; Gu, Jiaoyou; Zhu, Mingang; Zhang, Zhixin; and Tong, Keging. Air-cooling low-carbon bainitic steel. 4,812,182, Cl. 148-330.000.
Fanner, John C., to Onan Corporation. Carburetor altitude compensator apparatus. 4,812,266, Cl. 261-71.000.
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Kamiguchi, Masao; and Umemoto, Hiroshi, 4,812,268, Cl. 264-40.100.
Kiya, Nobuyuki; Toriyama, Shuji; and Saiki, Yoshiharu, 4,812,964, Cl. 364-140.000.
Fanuc Ltd: *See*—
Kurakake, Mitsuo; and Otsuka, Shoichi, 4,812,836, Cl. 340-724.000.
Farish, H. Greggs; and Hoge, Ross, to M-A-N Ashton Inc. Continuous web handling apparatus and method of separating web sections. 4,811,880, Cl. 226-197.000.
Farley, Radcliffe W.; Vaughn, Edward A.; Rodman, Clarke A.; and Homonoff, Edward C., to Allied-Signal Inc. Method of manufacture of formed article. 4,812,283, Cl. 264-518.000.
Farmer, Joseph C.: *See*—
Bonivert, William D.; Farmer, Joseph C.; and Hackman, John T., 4,812,210, Cl. 204-1.00T.
Farooq, Saleem; Ehrenfreund, Josef; and Waespe, Hans-Rudolf, to Ciba-Geigy Corporation. Pesticidal 2-pyridyl-4,5-dihydro-1,3,4-thiadiazoles. 4,812,464, Cl. 514-333.000.
Farr, William F.: *See*—
Waldman, Harold L.; Green, Charles B.; Fowler, A. Frederick; and Farr, William F., 4,811,428, Cl. 2-49.00R.
Farwaha, Rajeev: *See*—
Rempel, Garry L.; Mohammadi, Navroz A.; and Farwaha, Rajeev, 4,812,528, Cl. 525-338.000.
Fechner, Jimmy R., to Storage Technology Corporation. Head-to-disk interference detector. 4,812,927, Cl. 360-75.000.
Fedele, Nicola J., to General Electric Company. Modified statistical coding of digital signals. 4,813,056, Cl. 375-27.000.
Federmann, Dieter: *See*—
Kruger, Peter; and Federmann, Dieter, 4,811,985, Cl. 296-214.000.
Feichtiger, Dieter: *See*—
Hoffmann, Ruediger; Feichtiger, Dieter; Schumacher, Josef; Haller, Peter H.; and Heimbrodt, Klaus-J., 4,811,562, Cl. 60-370.000.
Felder, Christian, to Gebhardt Fordertechnik GmbH. Sorting installation for piece goods. 4,811,830, Cl. 198-372.000.
Feltz, John F.; Taylor, John W.; and Vuketich, Richard S., to Monarch Marking Systems, Inc. Electronic article surveillance system utilizing synchronous integration. 4,812,822, Cl. 340-572.000.
Fenie, Michel: *See*—
Labaig, Jean-Jacques; Fenie, Michel; and Glotin, Michel, 4,812,274, Cl. 264-80.000.
Ferag AG: *See*—
Hansch, Egon, 4,811,938, Cl. 270-54.000.
Reist, Walter, 4,811,548, Cl. 53-409.000.
Fernandez, Angel, to TRW Vehicle Safety Systems Inc. Comfort mechanism with slack set and memory. 4,811,913, Cl. 242-107.600.
Ferrante, Pat: *See*—
Piacenti, Frank; and Ferrante, Pat, 4,812,095, Cl. 411-188.000.
Ferrari Engineering S.p.A.: *See*—
Cassese, Ferdinando, 4,811,812, Cl. 180-295.000.
Cassese, Ferdinando, 4,811,970, Cl. 280-788.000.
Ferrari, Harry M.; and Shallenberger, John M., to Ball Hopper Products. Collapsible ball retriever and storage unit. 4,811,980, Cl. 294-19.200.
Ferraris, Giampiero; and Tersalvi, Antonio, to GTE Telecomunicazioni, S.p.A. Process to obtain thin film lines. 4,812,388, Cl. 430-314.000.
Ferrrari, Vittorio; Carenzi, Angelo; and Della Bella, Davide, to Zambon S.p.A. Thioesters for the treatment of ischemia and reperfusion syndromes. 4,812,477, Cl. 514-513.000.
Ferrus, Joele: *See*—
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Feuerbaum, Hans-Peter; and Frosien, Juergen, to Siemens Aktiengesellschaft. Spectrometer objective for particle beam measuring instruments. 4,812,651, Cl. 250-310.000.
Feustel, Edwar A.: *See*—
Chan, Carl; and Feustel, Edwar A., 4,812,981, Cl. 364-200.000.
Feygenson, Anatoly, to Thompson-CSF Components Corporation. Bipolar microwave integratable transistor. 4,812,890, Cl. 357-34.000.
Fichtel & Sachs AG: *See*—
Kittel, Friedrich; and Kolb, Dieter, 4,811,826, Cl. 192-70.130.
Fiedler, Paul; Braden, Rudolf; and Buding, Hartmuth, to Bayer Aktiengesellschaft. Process for selective hydrogenation of C—C double bonds in the presence of reducible, nitrogen-containing groups and new ruthenium complex compounds. 4,812,587, Cl. 556-136.000.
Fihey, Jean-Luc: *See*—
Alexandrov, Nicolas; Chretien, Normand; and Fihey, Jean-Luc, 4,812,608, Cl. 219-10.750.
Fillippone, Walter R.: *See*—
Erich, Otis G., Jr.; and Fillippone, Walter R., 4,813,029, Cl. 367-188.000.
Filmtec Corp.: *See*—
Cadotte, John E.; and Schmidt, Donald L., 4,812,238, Cl. 210-636.000.
Cadotte, John E.; and Walker, David R., 4,812,270, Cl. 264-48.000.
Fink, Richard A.: *See*—
Raymond, Bruce C.; and Fink, Richard A., 4,811,823, Cl. 192-21.500.
Finkel, Gilbert, to Food-Tek, Inc. Chocolate enrobed wafer products and method for preparing the same. 4,812,318, Cl. 426-94.000.
Finsterwalder, Ulrich. Threaded bar. 4,811,541, Cl. 52-737.000.
Fioravanti, Silverio: *See*—
Tamba, Alberto; Fioravanti, Silverio; and Scaccia, Antonio, 4,812,288, Cl. 420-443.000.
Fischer, Werner: *See*—
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Fischer, Wolfgang: *See*—
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Fischman, Harry H. Tamper proof bottle neck insert, inductively welded to a plastic bottle. 4,811,856, Cl. 215-250.000.
Fisher, Charles H.; and DiFaccio, Mark A., to Spectra-Physics, Inc. Method and apparatus for preionizing a self-sustained gas discharge device. 4,813,053, Cl. 372-86.000.
Fishkin, Theodore S.: *See*—
Wong, Mon N.; Patin, Robert J.; Fishkin, Theodore S.; and Chang, Donald C. D., 4,812,788, Cl. 333-113.000.
Fitzgerald, Susan S.: *See*—
Kennon, James A.; Islam, Shafidul; Popken, Jeffrey L.; Medders, Jerry B.; Fitzgerald, Susan S.; Kelley, Donald R.; and Burr, Philip A., 4,812,114, Cl. 425-116.000.
Fitzpatrick, Mark E.; and Graham, Andrew C., to Gazelle Microcircuits, Inc. Logic circuit connecting input and output signal leads. 4,812,683, Cl. 307-448.000.
Fitzsimmons, Robert A.: *See*—
Newell, Robert E.; Rand, Paul K.; and Fitzsimmons, Robert A., 4,811,731, Cl. 128-203.150.
Flanagan, Dennis F.; and Clark, Stephen H. Implantable percutaneous device. 4,812,120, Cl. 433-173.000.
Fleak, David S.; Rose, William H.; and Taylor, Attalee S., to AMP Incorporated. Floating mounting means for electrical connector assembly. 4,812,133, Cl. 439-248.000.
Fleck, Gerald W., to TRW Inc. Voltage regulator for solar cell arrays. 4,812,737, Cl. 323-271.000.
Fleissner, Gerold, to Fleissner Maschinenfabrik AG. Apparatus for flow-through treatment of textile material, paper, or the like. 4,811,574, Cl. 68-5.00D.
Fleissner, Gerold, to Fleissner GmbH & Co. Process for heat treatment of nonwovens. 4,812,284, Cl. 264-555.000.
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Fleming, Beverly M.: *See*—
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Flonic: *See—*
Lachat, Claude; and Ferrus, Joele, 4,812,805, Cl. 340-825.050.
Flora, Lawrence: *See—*
Anderson, Colin; and Flora, Lawrence, 4,812,304, Cl. 424-112.000.
Flowerdew, Peter M.; and Hore, Donald L., to Gas Research Institute, Inc. Apparatus and method for determining the position and orientation of a remote object. 4,812,812, Cl. 340-854.000.
Flueli, Adolf: *See—*
Busenhart, Peter; Schneeberger, Ruedi; Holbein, Erwin; Wirz, Armin; Flueli, Adolf; and Maier, Hansueli, 4,811,910, Cl. 242-18.00R.
FMC Corporation: *See—*
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Folienwalzwerk Brueder Teich Aktiengesellschaft: *See—*
Jud, Wilfried, 4,811,848, Cl. 206-610.000.
Folkmar, Jan, to Ice-Pack Service AG. Closure for the fluid-tight closing of bags, thin-walled tubes and the like. 4,811,465, Cl. 24-30.50R.
Fontan, Jacques; Kurzweil, Karel; and Dehaine, Gerard, to Bull, S.A. Method of and apparatus for mounting an IC chip. 4,812,949, Cl. 361-386.000.
Food Automation-Service Techniques, Inc.: *See—*
Albrecht, Lance M.; Pasquini, Mario; and Schreyer, William M., 4,812,963, Cl. 364-131.000.
Ceste, Mario G., Sr., 4,812,625, Cl. 219-497.000.
Food-Tek, Inc.: *See—*
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Foos, George M.: *See—*
Mead, Gary G.; and Foos, George M., 4,811,853, Cl. 211-124.000.
Foote, D. Paul, to Xerox Corporation. Process for forming electrophotographic images on a self-fusing substrate. 4,812,383, Cl. 430-126.000.
Ford Motor Company: *See—*
Sickafus, Edward N., 4,812,199, Cl. 156-626.000.
Van Kirk, Larry J.; and Waterloo, Ronald L., 4,811,760, Cl. 138-115.000.
Foreman, Howard R. Holder for target pattern paper. 4,811,956, Cl. 273-407.000.
Foster, Donald L., to United States of America, Army. Separator for lithium batteries and lithium batteries including the separator. 4,812,375, Cl. 429-101.000.
Foster, L. Dale; and Niese, Virgil J., to Hill-Rom Company, Inc. Hospital bed with pivoting headboard. 4,811,435, Cl. 5-60.000.
Foster, Scott H.: *See—*
Nazarathy, Moshe; Newton, Steven A.; and Foster, Scott H., 4,812,038, Cl. 356-73.100.
Fountain, Frank S.; Pusey, Donald K.; and McCloy, Keith A., to Du Pont de Nemours, E. I., and Company. Tape inspection apparatus. 4,812,923, Cl. 360-25.000.
Fowler, A. Frederick: *See—*
Waldman, Harold L.; Green, Charles B.; Fowler, A. Frederick; and Farr, William F., 4,811,428, Cl. 2-49.00R.
Fowler, George F., Jr.: *See—*
Lehnert, Charles W.; and Fowler, George F., Jr., 4,811,538, Cl. 52-455.000.
Fox, James D.: *See—*
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Frank, John A.: *See—*
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Frank, Wolfram: *See—*
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Franke, Peter. Asymmetric minimum resistance hull. 4,811,676, Cl. 114-56.000.
Franke, Werner; and Brahm, Richard, to Hoechst Aktiengesellschaft. Light-sensitive polycondensation product containing diazonium groups, process for the preparation thereof, and light-sensitive recording material containing this polycondensation product. 4,812,384, Cl. 430-175.000.
Fransson, Jan-Olof: *See—*
Bergstrom, Magnus; Gersbro, Stefan; and Fransson, Jan-Olof, 4,811,855, Cl. 215-243.000.
Bergstrom, Magnus; Gersbro, Per-Stefan; and Fransson, Jan-Olof, 4,811,957, Cl. 277-1.000.
Fratti, Marco; and Mattiolo, Marco. Casing with fixed and/or movable frames for doors, windows and the like. 4,811,532, Cl. 52-172.000.
Fredrich, Earl R.: *See—*
Kennedy, Richard E.; and Fredrich, Earl R., 4,812,825, Cl. 340-601.000.
Fredriksen, Paul, to Geophysical Company of Norway A.S. Data processing method, preferably from seismic streamers. 4,812,978, Cl. 364-421.000.
Freedman, Nathan; Keene, Wayne H.; and Jelalian, Albert V., to Raytheon Company. AM-FM laser radar. 4,812,035, Cl. 356-5.000.
Freeman, John W. H. Vehicle and method of indicating attainment of maximum axle load. 4,812,806, Cl. 340-440.000.
Freepons, Donald E. Plant growth regulators derived from chitin. 4,812,159, Cl. 71-16.000.
Freid, James R.: *See—*
Makhlouf, Joseph M.; Chau, Michael M.; and Freid, James R., 4,812,508, Cl. 524-764.000.
Freitag, Dieter: *See—*
Prater, Klaus; Uerdingen, Walter; Heine, Heinrich; and Freitag, Dieter, 4,812,589, Cl. 558-51.000.
Fremery, Johan K., to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Contact free magnetic bearing. 4,812,694, Cl. 310-90.500.
Frequin, Vincentius T. M., to U.S. Philips Corporation. Automatic gain control circuit having a control loop including a current threshold circuit. 4,812,908, Cl. 358-174.000.
Freuler, George H.: *See—*
Tracy, Theodore A.; and Freuler, George H., 4,812,754, Cl. 324-158.00F.
Frey, William A.: *See—*
Ballas, Robert A.; and Frey, William A., 4,812,395, Cl. 435-7.000.
Ballas, Robert A.; and Frey, William A., 4,812,396, Cl. 435-7.000.
Fricker, Ludwig, to Daimler-Benz Aktiengesellschaft. Sound insulated vehicle drive unit. 4,811,700, Cl. 123-198.00E.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Coenen, Hubert; Hagen, Rainer; and Reimann, Klaus, 4,812,233, Cl. 210-177.000.
Friedow, Michael, to Robert Bosch GmbH. Hydraulic brake system. 4,811,994, Cl. 303-115.000.
Friemel, Wolfgang; Barth, Volker; Munzel, Martin; and Ehret, Reiner, to Detia Freyberg GmbH. Method of fumigating agricultural products using hydrogen phosphide. 4,812,291, Cl. 422-28.000.
Fritsch, Horst, to Lewa Herbert OTT GmbH & Co. Hydraulically actuated stroke adjusting device. 4,811,624, Cl. 74-571.00L.
Fritsch, Rudy. Metal shearing machine. 4,811,640, Cl. 83-13.000.
Frosien, Juergen: *See—*
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Fruhauf, Serge: *See—*
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Fry, John J., to Babcock & Wilcox Company, The. Analog to digital conversion. 4,812,848, Cl. 341-157.000.
Fuchs, Harald; Gleiter, Herbert; Trapp, Stephan; and Petermann, Juergen, to Basf Aktiengesellschaft. Strain gage having a thin discontinuous metal layer. 4,812,800, Cl. 338-2.000.
Fuchsberger, Hermann, to AGfa-Gevaert Aktiengesellschaft. Method and apparatus for adjusting color saturation in electronic image processing. 4,812,902, Cl. 358-80.000.
Fuchsberger, Hermann: *See—*
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Fuderer, Miha; and Cuppen, Johannes J. M., to U.S. Philips Corp. Method and arrangement for determining a corrected MRI surface coil image. 4,812,753, Cl. 324-307.000.
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Matsuura, Sadaji; Arai, Yasuo; Aoki, Shigeki; and Ando, Satoru, 4,812,169, Cl. 106-15.050.
Fuji Photo Film Company: *See—*
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Fuji Photo Film Co., Ltd.: *See—*
Hanai, Kazuko; Yamada, Yasuyuki; and Miyoshi, Takahito, 4,812,369, Cl. 428-425.900.
Harada, Toru; and Iwakura, Ken, 4,812,440, Cl. 503-223.000.
Ishikuro, Tadashi; and Fujiyama, Masaaki, 4,812,330, Cl. 427-128.000.
Iwase, Yoshiki; and Kobayashi, Yasuhito, 4,812,919, Cl. 358-310.000.
Kobayashi, Shunsuke, 4,812,018, Cl. 350-341.000.
Minoura, Nobuo; and Nakadai, Katsuo, 4,812,922, Cl. 360-10.100.
Ohmura, Hiroshi; Asano, Seiji; and Yoshida, Toshio, 4,812,863, Cl. 354-219.000.
Okita, Tsutomu; Aonuma, Masashi; and Hashimoto, Hiroshi, 4,812,351, Cl. 428-141.000.
Sakanoue, Kei; Ichijima, Seiji; and Kishimoto, Shinzo, 4,812,389, Cl. 430-382.000.
Suzuki, Kenji, 4,812,879, Cl. 355-38.000.
Takashima, Yutaka; Tsuyuki, Mikio; and Seto, Izumi, 4,811,546, Cl. 53-266.00R.
Toya, Ichizo; and Yasuda, Tomokazu, 4,812,391, Cl. 430-564.000.
Ushiro, Seimei; Ohmura, Hiroshi; Cho, Michio; Tanaka, Tsutomu; Tanaka, Yasuhiko; Asano, Seiji; and Ohno, Kazunori, 4,812,866, Cl. 354-288.000.
Fujihara, Tadafumi: *See—*
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Fujikura Ltd.: *See—*
Sawano, Hiroyuki; Suzuki, Hideo; Sugawara, Yasuyuki; Kobayashi, Kazunaga; and Sato, Nobuyasu, 4,812,014, Cl. 350-96.290.
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Fujimoto, Daisaburo: *See—*
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Fujimoto, Hidetoshi: *See—*
Yamada, Takeshi; Fujimoto, Hidetoshi; Ito, Kenzo; and Hanabusa, Kazunori, 4,812,980, Cl. 364-449.000.
Fujimoto, Hiroshi: *See—*
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Fujimoto, Satoshi, to Kubota Ltd. Propelling drive transmission structure for walking operator type lawn mower. 4,811,552, Cl. 56-11.800.

Fujino, Akihiko; Ootsuka, Hiroshi; and Izumi, Tatsuro, to Minolta Camera Kabushiki Kaisha. Photographic information setting device for a camera. 4,812,862, Cl. 354-21.000.

Fujioka, Arisa; and Kageyama, Satoshi, to Kabushiki Kaisha Toshiba. Method for measuring the maximum gross weight of a motor vehicle. 4,813,004, Cl. 364-567.000.

Fujioka, Hironari: *See*—
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Fujioka, Yoshiki: *See*—
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Fujita, Keijiro: *See*—
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Fujita, Takeshi: *See*—
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Fujita, Yasuyuki; and Nishino, Takaichi, to Tachi-S Co. Ltd. Slide rail. 4,811,925, Cl. 248-430.000.

Fujitsu Limited: *See*—
Kawashima, Hiromi; and Takeuchi, Atsushi, 4,812,680, Cl. 307-350.000.
Kitamura, Toshiaki; Onishi, Katsumi; and Oinaga, Yuji, 4,812,970, Cl. 364-200.000.
Mochizuki, Akihiro; Iwasaki, Masayuki; Yamagishi, Yasuo; Ikegami, Kasumi; Gondo, Hiroyuki; and Yamaguchi, Hisashi, 4,812,034, Cl. 383-122.000.
Okada, Sumie; Nara, Takashi; Hatano, Takashi; Kawato, Yutaka; Shimozono, Ryoji; Tsutsumi, Kenji; Ogawa, Yasunori; and Tanaka, Yasuo, 4,812,839, Cl. 340-825.140.
Yamane, Kazuo; Mori, Masakazu; Tsuda, Takashi; Ohkuma, Yoshinori; and Suzuki, Kazuhiro, 4,813,048, Cl. 372-38.000.

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Fujiwara, Michio: *See*—
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Fujiyama, Masaaki: *See*—
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Fukada, Takeshi: *See*—
Yamazaki, Shunpei; Suzuki, Kunio; Kinka, Mikio; Fukada, Takeshi; Abe, Masayoshi; Kobayashi, Ippei; Shibata, Katsuhiko; Susukida, Masato; Nagayama, Susumu; and Koyanagi, Kaoru, 4,812,415, Cl. 437-2.000.

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Yoshioka, Takeo; Chida, Noritaka; Watanabe, Azuma; Fukagawa, Yasuo; and Ishikura, Tomoyuki, 4,812,563, Cl. 540-302.000.

Fukahori, Naoyuki: *See*—
Terada, Hiromu; Sakunaga, Kenichi; and Fukahori, Naoyuki, 4,812,012, Cl. 350-96.240.

Fukai, Naoki: *See*—
Yamaoka, Naoji; Ozawa, Shogo; Fukai, Naoki; Yuzawa, Masayuki; Nakamura, Takeshi; and Asano, Yutaka, 4,811,891, Cl. 228-182.000.

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Suzukamo, Gohfu; Fukao, Masami; and Sakito, Yoji, 4,812,264, Cl. 260-544.00L.

Fuke, Masanobu; Watanabe, Takemi; and Shiba, Noriyuki, to Kabushiki Kaisha Kaneda Kikai Seisakusho; and Kabushiki Kaisha Tokoyo Kikai Seisakusho. Tab attaching device used in an automatic device for preparing paper rolls for web pasting. 4,812,198, Cl. 156-497.000.

Fukuda, Satoshi: *See*—
Kobayashi, Kazuo; Togashi, Mitsuo; and Fukuda, Satoshi, 4,812,667, Cl. 250-578.000.

Fukuda, Tadanori; Sakamoto, Sadayuki; and Saito, Masami, to Toray Industries, Inc. Highly-refractive plastic lens. 4,812,032, Cl. 351-159.000.

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Oshima, Noboru; Chikatsu, Yoshishige; Fukuhori, Toshiaki; Hamada, Tatsuro; and Fujimaki, Tatsuo, 4,812,525, Cl. 525-232.000.

Fukui, Tomonori: *See*—
Yamada, Motokazu; Hayakawa, Hideyuki; Fukui, Tomonori; Matsuhashi, Hajime; Kaneko, Yasuhiro; Ikeda, Motozo; and Nagata, Tomihiko, 4,812,845, Cl. 340-995.000.

Fukuoka, Hidenori: *See*—
Iida, Takashi; Itoh, Masatoshi; Fukuoka, Hidenori; Tsukamoto, Takeya; Hamada, Masataka; Ishibashi, Kenji; and Ootsuka, Hiroshi, 4,812,912, Cl. 358-227.000.

Fukushima, Hiroshi: *See*—
Watanabe, Yoshiaki; Yokoo, Chihiro; Goi, Masami; Onodera, Akira; Murata, Mitsuo; Fukushima, Hiroshi; and Sota, Kaoru, 4,812,562, Cl. 540-227.000.

Fullerton, Larry W., to Phillips, Charles A., a part interest. Time domain radio transmission system. 4,813,057, Cl. 375-37.000.

Funck, Ronald; and Henry, Raymond, to Thomson-csf. Hyperfrequency semiconductor device having external connections established by beam-leads. 4,812,895, Cl. 357-69.000.

Fung, Min-Su: *See*—
Curtis, Huntington W.; Fung, Min-Su; and Verkuil, Roger L., 4,812,756, Cl. 324-158.00R.

Furihata, Tetsuo: *See*—
Kanahara, Naoyuki; Furo, Masahiro; and Furihata, Tetsuo, 4,811,893, Cl. 228-198.000.

Furness, Duncan S.: *See*—
Stewart, Alexander; Furness, Duncan S.; and Bhatia, Sham P., 4,812,929, Cl. 360-77.070.

Furo, Masahiro: *See*—
Kanahara, Naoyuki; Furo, Masahiro; and Furihata, Tetsuo, 4,811,893, Cl. 228-198.000.

Furrow, Robert E., to B. F. Electronics, Inc. Transmission brake disengagement circuit for a racing automobile. 4,812,671, Cl. 307-10.100.

Furuishi, Yoshiro; Suganami, Takuya; and Fujiwara, Michio, to Mitsubishi Denki Kabushiki Kaisha. Vibration-reducing apparatus. 4,811,563, Cl. 60-517.000.

Furukawa, Akihiro: *See*—
Oishi, Minoru; Morimoto, Yoshinari; Furukawa, Akihiro; Miura, Tomoko; Ikeda, Yoshie; and Nagatsuna, Akemi, 4,812,832, Cl. 340-709.000.

Furukawa, Yosio: *See*—
Nakagawa, Hiroto; Oono, Yasuteru; Kato, Tadaatsu; Nagura, Osamu; Niwa, Sadahiko; Furukawa, Yosio; and Kayukawa, Shigehiro, 4,812,730, Cl. 318-732.000.

Furusawa, Takashi: *See*—
Takeuji, Koichi; and Furusawa, Takashi, 4,812,617, Cl. 219-10.55R.

Furuta, Akihiro: *See*—
Oi, Fumio; Osaki, Haruyoshi; Furuta, Akihiro; Uemura, Yukikazu; Ninomiya, Takao; Uetani, Yasunori; and Hanabata, Makoto, 4,812,551, Cl. 528-129.000.

Fusion Systems Corporation: *See*—
Hill, James D., 4,812,957, Cl. 362-263.000.

Futato, Steven P. Method and apparatus for transmitting digital data and real-time digitalized voice information over a communications channel. 4,813,040, Cl. 370-111.000.

G. D. Searle & Co.: *See*—
Campbell, Arthur L.; and Miyano, Masateru, 4,812,474, Cl. 514-460.000.
Masateru, Miyano; and Shone, Robert L., 4,812,584, Cl. 549-417.000.

G. & E. Engineering Ltd.: *See*—
Eilertsen, John L., 4,812,690, Cl. 310-27.000.

GAF Corporation: *See*—
Suwala, David W., 4,812,255, Cl. 252-142.000.

Gagliardi, Claudio: *See*—
Renzi, Fiorenzo; Rivetti, Franco; Romano, Ugo; and Gagliardi, Claudio, 4,812,545, Cl. 526-230.500.

Gajewski, Wolfgang: *See*—
Schmelz, Helmut; Thomann, Helmut; Kuschke, Renate; Wilbert, Eva-Helga; Gajewski, Wolfgang; Sprehe, Josef; Landgraf, Norbert; Ranly, Hans; Balling, Lothar; Reppisch, Richard; and Hein, Dietmar, 4,812,296, Cl. 423-239.000.

Galati, Celeste C., to Motion Control Industries, Inc. Method of fibrillating fibers. 4,811,908, Cl. 241-21.000.

Gale, Allan R.; and Hoppie, Lyle O., to Eaton Corporation. Transducer linearizing system. 4,812,747, Cl. 324-132.000.

Gale, Robert M., to ALZA Corporation. Method for lessening the incidence of anginal attacks. 4,812,313, Cl. 424-448.000.

Galloway, James G.: *See*—
Leadbetter, Arthur N.; and Galloway, James G., 4,812,496, Cl. 524-47.000.

Gamble, Nolan D.: *See*—
Siegel, Edmond; and Gamble, Nolan D., 4,811,439, Cl. 5-475.000.

Gambro Dialysatoren KG: *See*—
Harttig, Erich H.; Buck, Reinhold J.; and Gohl, Hermann J., 4,812,269, Cl. 264-41.000.

Garrison, Paul H., Jr.: *See*—
Small, Leonard E.; Garrison, Paul H., Jr.; Winkler, William M.; Seaman, Sharon A.; and Papa, Alyce J., 4,812,253, Cl. 252-132.000.

Gary, William: *See*—
Sheridan, Nicholas K.; Stearns, Richard G.; Frank, John A.; Casey, Brendan; and Gary, William, 4,812,860, Cl. 346-159.000.

Gas Research Institute, Inc.: *See*—
Flowerdew, Peter M.; and Hore, Donald L., 4,812,812, Cl. 340-854.000.

Gasiunas, Donatas: *See*—
Storace, Anthony; and Gasiunas, Donatas, 4,812,992, Cl. 364-464.020.

Gassmann, Helmut, to GTM Gassmann Theiss Messtechnik GmbH. Weighing cell. 4,811,610, Cl. 73-862.650.

Gatt, Shimon: *See*—
Harnoy, Gideon N.; Gatt, Shimon; and Barenholtz, Yechezkel, 4,811,791, Cl. 166-305.100.

Gauron, Richard F. Inset panel fastener and method of using. 4,812,193, Cl. 156-293.000.
Gavin, David F.: *See—*
Rothgery, Eugene F.; Hart, William W. C.; Smith, Edward F., III; Phillips, Steven D.; Sandel, Bonnie B.; and Gavin, David F., 4,812,896, Cl. 357-70.000.
Gazelle Microcircuits, Inc.: *See—*
Fitzpatrick, Mark E.; and Graham, Andrew C., 4,812,683, Cl. 307-448.000.
Geary, Timothy C. Self-contained ladder system for a boat. 4,811,817, Cl. 182-76.000.
Gebhardt Fordertechnik GmbH: *See—*
Felder, Christian, 4,811,830, Cl. 198-372.000.
Gehring, Reinhold: *See—*
Schallner, Otto; Gehring, Reinhold; Stetter, Jorg; Santel, Hans-Joachim; Schmidt, Robert R.; Lurssen, Klaus; and Strang, Harry, 4,812,165, Cl. 71-92.000.
Geibel, Jon F.: *See—*
Cliffton, Michael D.; and Geibel, Jon F., 4,812,552, Cl. 528-226.000.
Gelfand, Mikhail L.: *See—*
Antipov, Georgy A.; Gelfand, Mikhail L.; Goldshtein, Boris G.; Kornilicv, Gennady A.; Lavnikov, Nikolai S.; Tsipenjuk, Yakov I.; and Yakubovsky, Petr S., 4,811,797, Cl. 173-93.600.
Gemma, Takashi: *See—*
Yokokura, Takashi; Gemma, Takashi; and Satoh, Takuji, 4,812,042, Cl. 356-348.000.
GenCorp Inc.: *See—*
Erickson, David E.; and Reed, Thomas F., 4,812,550, Cl. 527-201.000.
Genentech, Inc.: *See—*
Riggs, Arthur D., 4,812,554, Cl. 530-311.000.
General Dynamics Corporation: *See—*
Otto, Vedon W., 4,812,849, Cl. 342-194.000.
General Electric Company: *See—*
Anderson, M. John, 4,812,702, Cl. 313-153.000.
Bakanowski, Stephen M.; and Mapes, William H., 4,811,567, Cl. 62-129.000.
Bottomley, Paul A.; Hardy, Christopher J.; O'Donnell, Matthew; and Roemer, Peter B., 4,812,760, Cl. 324-309.000.
Fedele, Nicola J., 4,813,056, Cl. 375-27.000.
Gluntz, Douglas M., 4,812,286, Cl. 376-282.000.
Gullberg, Grant T.; and Crawford, Carl R., 4,812,983, Cl. 364-413.170.
Jayakumar, Raghavan, 4,812,797, Cl. 335-299.000.
Kern, Jeffrey A., 4,812,624, Cl. 219-450.000.
Lau, Monica M.; and Coffinberry, George A., 4,811,556, Cl. 60-206.000.
Leonard, Gary L., 4,811,706, Cl. 123-196.00R.
Ortiz Jr., Angel L., 4,812,641, Cl. 250-205.000.
Piper, William W., 4,812,017, Cl. 350-333.000.
Toda, Minoru, 4,813,047, Cl. 372-38.000.
General Electric Company, p.l.c., The: *See—*
Smith, Arthur R., 4,812,135, Cl. 439-493.000.
General Motors Corporation: *See—*
Micheli, Adolph L., 4,812,333, Cl. 427-226.000.
General Tire, Inc.: *See—*
Shoemaker, Paul S.; and Kelley, John D., Jr., 4,811,771, Cl. 152-454.000.
Genth, Richard E., to Donzi Marine Corporation. Gullwing-type deck hatch assembly. 4,811,680, Cl. 114-201.00R.
Geophysical Company of Norway A.S.: *See—*
Fredriksen, Paul, 4,812,978, Cl. 364-421.000.
Geo. A. Hormel & Co.: *See—*
Ruzek, David C., 4,812,320, Cl. 426-393.000.
George, Carroll H.; Lynott, Guy W.; and Pargellis, Andrew N., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Method and apparatus for continuous throughput in a vacuum environment. 4,812,101, Cl. 414-220.000.
George, Carroll H.; and Rust, Ray D., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Method and apparatus for feeding and coating articles in a controlled atmosphere. 4,812,217, Cl. 204-192.120.
George Weston Limited: *See—*
Lawford, Hugh G., 4,812,410, Cl. 435-161.000.
Georgia-Pacific Corporation: *See—*
Lehnert, Charles W.; and Fowler, George F., Jr., 4,811,538, Cl. 52-455.000.
Gephart, John D.; and Jerila, Torsti T. T., to Acme General Corporation. Sliding door wheel retainer. 4,811,683, Cl. 16-97.000.
Gerber, Arthur M. Method of making a digital recording medium. 4,812,218, Cl. 204-192.270.
Gerd, Fuhrer: *See—*
Christian, Klaus; and Gerd, Fuhrer, 4,811,825, Cl. 192-53.00F.
Gergely, Stephen: *See—*
Economides, Apollo P.; Gergely, Stephen; and Walton, Christopher, 4,811,738, Cl. 128-419.0PG.
Gerke, Dieter: *See—*
Biederstedt, Lutz; Gerke, Dieter; and Sander, Claus, 4,812,004, Cl. 350-96.200.
Gersbro, Per-Stefan: *See—*
Bergstrom, Magnus; Gersbro, Per-Stefan; and Fransson, Jan-Olof, 4,811,957, Cl. 277-1.000.
Gersbro, Stefan: *See—*
Bergstrom, Magnus; Gersbro, Stefan; and Fransson, Jan-Olof, 4,811,855, Cl. 215-243.000.
Gerulis, Benedict R., to C.I.B., Inc. Fluid filter. 4,812,230, Cl. 210-108.000.
GFS Manufacturing Company, Inc.: *See—*
Sylvester, Robert D., Jr.; Horn, Paul C.; and Bober, Vincent J., 4,811,477, Cl. 29-605.000.
Giannesi, Pier G., to Minnesota Mining and Manufacturing Company. Process and element for obtaining a photographic image. 4,812,390, Cl. 430-434.000.
Gibboni, David J.: *See—*
Cohen, Richmond R.; and Gibboni, David J., 4,811,745, Cl. 131-342.000.
Giglia, Salvatore: *See—*
Coplan, Myron J.; and Giglia, Salvatore, 4,812,184, Cl. 156-84.000.
Giha, Salvador N. Fuel pump lever holding member. 4,811,765, Cl. 141-392.000.
Gill, Gerald L., Jr. Counterbalanced polishing apparatus. 4,811,522, Cl. 51-131.100.
Gillette, Paul C., to Hercules Incorporated. Crosslinking of vinyl silane and azidosilane modified thermoplastic polymers by moisture. 4,812,519, Cl. 525-106.000.
Gilliksen, Byron. Education or learning aid method. 4,812,126, Cl. 434-238.000.
Gilmer, Thomas C.; and Chang, David C. K., to E. I Du Pont De Nemours and Company. Amino methyl propanol blocked aromatic sulfonic acid. 4,812,506, Cl. 524-512.000.
Gilmore, Danny R.: *See—*
White, Kevin R.; and Gilmore, Danny R., 4,812,069, Cl. 401-195.000.
Gilpatrick, Michael W., to Milliken Research Corporation. Radio-opaque marker and method. 4,813,062, Cl. 378-162.000.
Giorgini, Norman L.: *See—*
Vogelgesang, Peter J.; Ulseth, John W.; Giorgini, Norman L.; and Edwards, Jathan D., 4,812,633, Cl. 235-487.000.
Girard, Donald J., to NCR Corporation. Multiple mode switching means. 4,812,840, Cl. 340-825.500.
Girgis, Adly A.; and Brown, Robert G. Adaptive Kalman Filtering in fault classification. 4,812,995, Cl. 364-481.000.
Giubardo, Mark J., to Digital Marine Electronics Corporation. Radio receiver with automatic interference cancellation. 4,812,851, Cl. 342-389.000.
Giuliani, Marcello. Pneumatic assembly for waste removal. 4,811,464, Cl. 19-107.000.
Giustina International S.P.A.: *See—*
Corallo, Valeriano, 4,811,524, Cl. 51-165.00R.
Glattstein, Baruch; and Aserin, Abraham, to Erez Forensic Technology, Ltd. Reagent, process and kit for drug detection. 4,812,413, Cl. 436-92.000.
Glaxo Group Limited: *See—*
Newell, Robert E.; Rand, Paul K.; and Fitzsimmons, Robert A., 4,811,731, Cl. 128-203.150.
Gleiter, Herbert: *See—*
Fuchs, Harald; Gleiter, Herbert; Trapp, Stephan; and Petermann, Juergen, 4,812,800, Cl. 338-2.000.
Glickman, Ilan: *See—*
Levy, Amir; Glickman, Ilan; Berezniak, Haim; and Rosenberg, Avraham, 4,811,664, Cl. 102-226.000.
Glidden Company, The: *See—*
Barnett, Gerald W.; and Chen, Tien T., 4,812,510, Cl. 524-807.000.
Hahn, Kenneth G., Jr., 4,812,491, Cl. 523-310.000.
Toman, Perry A., 4,812,523, Cl. 525-162.000.
Glotin, Michel: *See—*
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Gluntz, Douglas M., to General Electric Company. Shroud tank and fill pipe for a boiling water nuclear reactor. 4,812,286, Cl. 376-282.000.
Gocht, Ronald E.: *See—*
Woods, Daniel E.; Gocht, Ronald E.; Higgins, Peter M.; Edwards, Anne M.; Rowlands, Hugh; Scanlon, Edward F.; and Putzer, Jerry, 4,813,077, Cl. 382-7.000.
Godfrey, Christopher R. A.: *See—*
Anthony, Vivienne M.; Clough, John M.; Godfrey, Christopher R. A.; and de Fraine, Paul J., 4,812,162, Cl. 71-90.000.
Goeltz, Jeffrey. Pile-height bar governor for printing press pile feeders. 4,811,940, Cl. 271-155.000.
Goetschius, Gary C.: *See—*
Cox, William C.; Goetschius, Gary C.; and Casagrande, Mark T., 4,813,003, Cl. 364-557.000.
Goetting, Erich, to Exel Microelectronics Incorporated. Security element circuit for programmable logic array. 4,812,675, Cl. 307-443.000.
Goetz, Norbert: *See—*
Hoelderich, Wolfgang; Goetz, Norbert; and Hupfer, Leopold, 4,812,593, Cl. 560-183.000.
Gohl, Hermann J.: *See—*
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Goi, Masami: *See—*
Watanabe, Yoshiaki; Yokoo, Chihiro; Goi, Masami; Onodera, Akira; Murata, Mitsuo; Fukushima, Hiroshi; and Sota, Kaoru, 4,812,562, Cl. 540-227.000.
Gold, Peter N. Automotive window mounting assembly. 4,811,519, Cl. 49-375.000.
Gold Star Co., Ltd.: *See—*
Jeon, Jin S., 4,812,926, Cl. 360-70.000.

Golden Star, Inc.: *See*—
Quearry, Robert W.; Chalfant, Robert D.; Chalfant, Richard W.; and Liggett, Robert E., 4,811,989, Cl. 300-21.000.
Quearry, Robert W.; Chalfant, Robert D.; Chalfant, Richard W.; and Liggett, Robert E., 4,811,990, Cl. 300-21.000.
Goldshtein, Boris G.: *See*—
Antipov, Georgy A.; Gelfand, Mikhail L.; Goldshtein, Boris G.; Kornilie', Gennady A.; Lavnikov, Nikolai S.; Tsipenjuk, Yakov I.; and Yakubovsky, Petr S., 4,811,797, Cl. 173-93.600.
Golias, Tipton, to Helena Laboratories Corporation. Method and apparatus for dispensing liquids. 4,811,866, Cl. 222-189.000.
Golla, Rainer: *See*—
Streubel, Hans; Golla, Rainer; and Kolakowski, Manfred, 4,811,779, Cl. 164-418.000.
Gombas, Robert P.: *See*—
Duggan, John A.; and Gombas, Robert P., 4,811,520, Cl. 49-409.000.
Goncalves, Antonin; and Osmond, Philippe, to L'Oreal. Device for manually massaging the cutaneous covering. 4,811,726, Cl. 128-57.000.
Gondo, Hiroyuki: *See*—
Mochizuki, Akihiro; Iwasaki, Masayuki; Yamagishi, Yasuo; Ikegami, Kasumi; Gondo, Hiroyuki; and Yamaguchi, Hisashi, 4,812,034, Cl. 383-122.000.
Gonsalves, Edward M.: *See*—
Cobb, Carleton M., III; Hirsbrunner, Hans G.; Gonsalves, Edward M.; Jenne, Richard L.; and Nott, Sepideh H., 4,812,799, Cl. 337-70.000.
Goodman, David C.: *See*—
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Goodyear Tire & Rubber Company, The: *See*—
Beard, Richard C.; and Crispin, Carl W., 4,812,281, Cl. 264-502.000.
Colvin, Howard A., 4,812,487, Cl. 521-159.000.
Gorisch, Wolfram, to W. C. Heraeus GmbH. Beam guiding optical system for laser radiation. 4,812,613, Cl. 219-121.740.
Gostin, Gary B.: *See*—
Chastain, David M.; and Gostin, Gary B., 4,812,972, Cl. 364-200.000.
Goswami, Ramanuj; and Chen, Chin H., to Eastman Kodak Company. Fluorescent dyes and biological and analytical uses thereof. 4,812,393, Cl. 435-4.000.
Gotman, Linda; and Gotman, Nickolas K. Savings bank. 4,811,828, Cl. 194-351.000.
Gotman, Nickolas K.: *See*—
Gotman, Linda; and Gotman, Nickolas K., 4,811,828, Cl. 194-351.000.
Goto, Susumu; Kumabe, Yuichi; and Okunuki, Masahiko, to Canon Kabushiki Kaisha. Alignment system using an electron beam. 4,812,662, Cl. 250-491.100.
Gotoh, Toshihiro: *See*—
Endo, Hiroshi; and Gotoh, Toshihiro, 4,812,484, Cl. 521-60.000.
Goulet, Michel. Theft protection cable and circuit including said cable. 4,812,670, Cl. 307-10.200.
Goumy, Daniel: *See*—
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Goyal, Ambuj: *See*—
Kumar, Manoj; Goyal, Ambuj; and Rathi, Bharat D., 4,813,044, Cl. 371-55.000.
GPAC, Inc.: *See*—
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GQ Defence Equipment Limited: *See*—
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Grabow, Glen M.: *See*—
Altenschulte, Raymond A.; and Grabow, Glen M., 4,812,130, Cl. 439-84.000.
Graco Metal Products, Inc.: *See*—
Dillner, James M.; and Saint, Nathanael, 4,811,437, Cl. 5-99.00B.
Graflind, Ulf: *See*—
Asbrink, Leif; and Graflind, Ulf, 4,812,811, Cl. 340-571.000.
Graham, Andrew C.: *See*—
Fitzpatrick, Mark E.; and Graham, Andrew C., 4,812,683, Cl. 307-448.000.
Graham, Randall C.; Smith, James D., Jr.; and Smith, Jeffrey S., to Essex Group, Inc. Wire drawing control apparatus. 4,812,721, Cl. 318-66.000.
Graham, Samuel L.; and Scholz, Thomas H., to Merck & Co., Inc. Alkanesulfonamides as antiglaucoma agents. 4,812,463, Cl. 514-311.000.
Gramse, James R.: *See*—
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Granger Associates: *See*—
Bishop, H. John; Merrias, Morley M.; Ohlsson, Thomas L.; and Sopira, Terrence G., 4,813,035, Cl. 370-50.000.
Granstrom, Staffan, to NAB-Konsult. Method and device for pre-heating waste metal for furnaces. 4,812,117, Cl. 432-9.000.
Grape, Wolfgang: *See*—
Kress, Hans-Jurgen; Lindner, Christian; Grape, Wolfgang; Peters, Horst; Schoeps, Jochen; and Wittmann, Dieter, 4,812,515, Cl. 525-69.000.
Grasser, Franz, to Siemens Aktiengesellschaft. Extracorporeal lithotripsy apparatus. 4,811,725, Cl. 128-24.00A.
Gray, Joe W.: *See*—
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Gray, Steven M.: *See*—
Humphreys, Robert E.; and Gray, Steven M., 4,813,070, Cl. 379-213.000.
Great Wave Company, Inc., The: *See*—
Raike, George W., 4,812,077, Cl. 405-79.000.
Green, Charles B.: *See*—
Waldman, Harold L.; Green, Charles B.; Fowler, A. Frederick; and Farr, William F., 4,811,428, Cl. 2-49.00R.
Green, James. Deer stand. 4,811,803, Cl. 180-7.500.
Greene, Benjamin F. Garden tiller with reciprocating tines. 4,811,794, Cl. 172-43.000.
Greene, Trace D.: *See*—
Kupferschmidt, Albert; Greene, Trace D.; and Jaycox, Donald F., 4,812,942, Cl. 361-119.000.
Gress, Paul W.; and Wesebaum, Paul E., to Emerson Electric Co. Drive bar attachment for threading machines. 4,811,639, Cl. 82-110.000.
Gribble, Andrew D.: *See*—
Durant, Graham J.; Gribble, Andrew D.; and Slater, Robert A., 4,812,573, Cl. 514-307.000.
Griffin, Rodney L.; Ciliberti, David F.; and Lippert, Thomas E., to Westinghouse Electric Corp. Hot inert gas purging for filter blowback process. 4,812,149, Cl. 55-71.000.
Griffin, William R.: *See*—
Chu, Albert M.; and Griffin, William R., 4,812,688, Cl. 307-605.000.
Griffith, Monty: *See*—
Vandervoort, David; and Griffith, Monty, 4,812,321, Cl. 426-503.000.
Griffiths, Richard W., to G2 Systems Corporation. Structural monitoring system using fiber optics. 4,812,645, Cl. 250-227.000.
Griggs, Calvin; and Horn, J. C., to Treace Medical, Inc. Surgical drill and bur for use therewith. 4,811,736, Cl. 128-305.100.
Grim, Kenneth R.: *See*—
Burns, Richard J.; Grim, Kenneth R.; and Levy, Miguel E., 4,813,006, Cl. 364-604.000.
Grimble, Ralph E.; and Somers, Edward V., to Westinghouse Electric Corp. Fuel feed arrangement for a fuel cell generator. 4,812,373, Cl. 429-19.000.
Grina, Larry D.: *See*—
Liu, Christopher S.; Benfaremo, Nicholas; Kapuscinski, Maria M.; and Grina, Larry D., 4,812,261, Cl. 252-51.50A.
Grobl, George. Lighted lure headpiece. 4,811,513, Cl. 43-17.600.
Groeneweg, Jan W.: *See*—
Staal, Leendert H.; Vis, Jan C.; and Groeneweg, Jan W., 4,812,436, Cl. 502-407.000.
Grooms, Joseph J. Method and apparatus for installing continuous lengths of material. 4,811,918, Cl. 242-55.200.
Gros, Pierre: *See*—
Staron, Philippe; and Gros, Pierre, 4,811,814, Cl. 181-108.000.
Grosser, Helmut: *See*—
Meins, Jurgen; and Grosser, Helmut, 4,812,757, Cl. 324-207.000.
Grube, William L., to MacLean-Fogg Company. Locking fastener assembly for threaded joint. 4,812,094, Cl. 411-134.000.
Gruden, Dusan, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Combustion space for a reciprocating piston internal combustion engine. 4,811,708, Cl. 123-299.000.
Gryk, Leon, to Electro-Mechanics, Inc. Isolation amplifier. 4,812,778, Cl. 330-51.000.
GTE Communication Systems Corporation: *See*—
Belanger, Thomas D., Jr.; and Johnson, Roy L., 4,812,947, Cl. 361-220.000.
GTE Products Corporation: *See*—
Keeffe, William M.; Waymouth, John F.; and Zaslavsky, Gregory, 4,812,714, Cl. 315-60.000.
Wagenknecht, Arthur J.; Anderson, John R.; and Guzikowski, Joseph A., 4,812,705, Cl. 313-406.000.
GTE Telecomunicazioni, S.p.A.: *See*—
Ferraris, Giampiero; and Tersalvi, Antonio, 4,812,388, Cl. 430-314.000.
GTE Valenite Corporation: *See*—
Stashko, Daniel R., 4,812,087, Cl. 407-42.000.
GTM Gassmann Theiss Messtechnik GmbH: *See*—
Gassmann, Helmut, 4,811,610, Cl. 73-862.650.
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Fang, Hongsheng; Zhao, Rufa; Zheng, Yankang; Chen, Ziuyun; He, Guangchu; Gu, Jiaoyou; Zhu, Mingang; Zhang, Zhixin; and Tong, Keging, 4,812,182, Cl. 148-330.000.
Guenette, Gerald R.: *See*—
Epstein, Alan H.; Guenette, Gerald R.; and Norton, Robert J. G., 4,812,050, Cl. 374-1.000.
Gueret, Jean Louis H., to L'Oreal. Device for applying a pasty product, in particular a cosmetic product such as lipstick and a tubular element for such a device. 4,812,066, Cl. 401-78.000.
Guigan, Jean. Method of performing medical analyses, and a conditioning strip and apparatus for performing the method. 4,812,411, Cl. 435-293.000.
Guistina, Robert A.: *See*—
Bugner, Douglas E.; Alexandrovich, Peter S.; DeMejo, Lawrence P.; Guistina, Robert A.; and Anderson, James H., 4,812,378, Cl. 430-110.000.
Bugner, Douglas E.; Alexandrovich, Peter S.; DeMejo, Lawrence P.; and Guistina, Robert A., 4,812,381, Cl. 430-110.000.
Gulf Canada Resources Limited: *See*—
Corti, Aldo; and Falcon, John A., 4,812,225, Cl. 208-13.000.
Gullberg, Grant T.; and Crawford, Carl R., to General Electric Company. Method and means of correcting for a shift in the center of rotation of a rotating fan beam CT system. 4,812,983, Cl. 364-413.170.

Gullichsen, Johan; and Hynninen, Pertti, to A. Ahlstrom Corporation. Method of removing lignin from bleach plant effluents. 4,812,207, Cl. 162-29.000.

Gunda, Rajsmouli: *See*—
Edwards, Thomas L.; El-Ibiary, Yehia M.; Gunda, Rajsmouli; Leemhuis, Richard S.; Phillips, Fred H.; and Rode, Melvin A., 4,811,561, Cl. 60-368.000.

Gunia, Ewald: *See*—
Ziemek, Gerhard; Staschewski, Harry; and Gunia, Ewald, 4,811,888, Cl. 228-148.000.

Gunnarsson, Sven-Eric, to Asea AB. Arrangement for distributing a cable assemblage betwen two mutually rotatable component parts. 4,812,132, Cl. 439-164.000.

Guntert, Josef; and Warga, Johann, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,811,716, Cl. 123-503.000.

Gunther, Werner: *See*—
Heubeck, Erich; Gunther, Werner; Muther, Manfred; and Werner, Leonhard, 4,813,060, Cl. 378-39.000.

Gunton, David J.; and Manning, Lucy J., to British Gas plc. Method and apparatus for combining waveforms. 4,812,850, Cl. 342-22.000.

Gurnee, Mark N., to Honeywell Inc. Multiplexer elements for photovoltaic detectors. 4,812,668, Cl. 250-578.000.

Gutierrez, J. Guadalupe. Cube and pegs assembly puzzle. 4,811,948, Cl. 273-156.000.

Guttman, Richard T.: *See*—
Sue, Horace O.; Guttman, Richard T.; Pendley, David M.; and Keys, William C., 4,812,674, Cl. 307-116.000.

Guu, Cheng-Show: *See*—
Wang, Tzay-Chyuan; and Guu, Cheng-Show, 4,812,614, Cl. 219-124.340.

Guzikowski, Joseph A.: *See*—
Wagenknecht, Arthur J.; Anderson, John R.; and Guzikowski, Joseph A., 4,812,705, Cl. 313-406.000.

Guzman, Alberto: *See*—
Kaufman, William M.; and Guzman, Alberto, 4,812,826, Cl. 340-682.000.

G2 Systems Corporation: *See*—
Griffiths, Richard W., 4,812,645, Cl. 250-227.000.

H. C. Spinks Clay Company Inc.: *See*—
Kohut, William, 4,812,427, Cl. 501-148.000.
Kohut, William, 4,812,428, Cl. 501-148.000.

hasocn hebetechnik gmbh: *See*—
Riedl, Reinhold, 4,811,930, Cl. 254-45.000.

Haberthur, Walter, to Bron Elektronik AG. Mount for photographic lighting equipment. 4,811,923, Cl. 248-278.000.

Hacker, Heinz: *See*—
Kleeberg, Wolfgang; Hacker, Heinz; Huber, Jurgen; Wilhelm, Dieter; and Laupenmuhlen, Heinz K., 4,812,490, Cl. 523-443.000.

Hackman, John T.: *See*—
Bonivert, William D.; Farmer, Joseph C.; and Hackman, John T., 4,812,210, Cl. 204-1.00T.

Haden, John D.; and Duxbury, Eric, to D. H. Haden Limited. Electrical apparatus. 4,812,623, Cl. 219-437.000.

Haferl, Peter E., to RCA Licensing Corporation. High voltage stabilization circuit for video display apparatus. 4,812,720, Cl. 315-411.000.

Hagemann, Gottfried: *See*—
Honig, Ernst-August; Kaspar, Lothar; Kalversberg, Manfred; Oberpichler, Gerd; Hagemann, Gottfried; and Schmidt, Dieter, 4,811,631, Cl. 74-762.000.

Hagen, Rainer: *See*—
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Hagiwara, Kenji; Ishikawa, Hisao; Hosaka, Hideo; and Inaba, Hideo, to Nippon Soda Co., Ltd. Thia (oxa) diazole derivatives. 4,812,161, Cl. 71-90.000.

Hagiwara, Masato: *See*—
Okuma, Shigeki; and Hagiwara, Masato, 4,811,903, Cl. 239-284.200.

Hagiwara, Yoshimune: *See*—
Takagi, Katsuaki; Aoki, Hirokazu; Nakagawa, Norio; and Hagiwara, Yoshimune, 4,812,969, Cl. 364-200.000.

H ahansson, Rolf G. R.: *See*—
Larsson, Bertil; Andersson, Erik T.; and H ahansson, Rolf G. R., 4,812,644, Cl. 250-223.00R.

Hahn, Kenneth G., Jr., to Glidden Company, The. Thermosetting acrylic latexes. 4,812,491, Cl. 523-310.000.

Hajime, Toguchi: *See*—
Yasushi, Mikura; Kensuke, Asada; and Hajime, Toguchi, 4,812,557, Cl. 530-351.000.

Hake, Leon M., to Wittwer Construction Co., Inc. Doweling tool. 4,812,088, Cl. 408-130.000.

Halbert, Eric H.: *See*—
Steeves, Jay M.; and Halbert, Eric H., 4,811,882, Cl. 227-8.000.

Halbrite Well Services Co. Ltd.: *See*—
Weber, James L., 4,811,785, Cl. 166-242.000.

Hale, Arthur H.: *See*—
Lawson, Horace F.; and Hale, Arthur H., 4,812,244, Cl. 252-8.514.

Hall, Christopher W. G., to Pilkington Brothers P.L.C. Impact-resistant laminate. 4,812,359, Cl. 428-332.000.

Hall, Raymond J., to Compair Power Tools Limited. Safety valve. 4,811,756, Cl. 137-498.000.

Haller, Peter H.: *See*—
Hoffmann, Ruediger; Feichtiger, Dieter; Schumacher, Josef; Haller, Peter H.; and Heimbrodt, Klaus-J., 4,811,562, Cl. 60-370.000.

Halton Oy: *See*—
Aalto, Erkki; Korhonen, Kaarlo; Pekkinen, Jorma; Sundberg, Esa; Tolmunen, Arvi; Vartiainen, Seppo; and Villikka, Reijo, 4,811,724, Cl. 126-299.00D.

Halvis, James; Bluzer, Nathan; and Shiskowski, Robert, to United States of America, Air Force. Solid state gas pressure sensor. 4,812,801, Cl. 338-4.000.

Hamada, Masataka: *See*—
Iida, Takashi; Itoh, Masatoshi; Fukuoka, Hidenori; Tsukamoto, Takeya; Hamada, Masataka; Ishibashi, Kenji; and Ootsuka, Hiroshi, 4,812,912, Cl. 358-227.000.

Hamada, Tatsuro: *See*—
Oshima, Noboru; Chikatsu, Yoshishige; Fukuhori, Toshiaki; Hamada, Tatsuro; and Fujimaki, Tatsuo, 4,812,525, Cl. 525-232.000.

Hamanishi, Yoshinari: *See*—
Utagawa, Ken; and Hamanishi, Yoshinari, 4,812,868, Cl. 354-402.000.

Hamashima, Yoshio; Misami, Kyoji; Kawata, Kyozo; Sakamoto, Teruo; Takeda, Toyohiko; Suzuki, Yusuke; and Tujikawa, Masanori, to Shionogi & Co., Ltd. Crystalline hydrate of oral cephalosporin and its composition. 4,812,561, Cl. 340-222.000.

Hamblin, Charles R. Double-sided adhesive cleaning apparatus. 4,811,444, Cl. 15-104.00A.

Hambrick, Paul R.; Wagner, Martin; and Whitaker, Kerry W., to Ja-Pac, Inc. Article storage and retrieval system. 4,812,985, Cl. 364-478.000.

Hamey, Peter M.: *See*—
Walters, Ronald B.; and Hamey, Peter M., 4,811,607, Cl. 73-861.530.

Hamilton, John C.: *See*—
Mullin, John B.; Hamilton, John C.; Orrell, Elisabeth D.; Jacobs, Philip R.; and Shenai-Khatkhate, Deodattta V., 4,812,586, Cl. 556-129.000.

Hammann, Rainer; Weber, Friedrich; and Rohm, Peter, to Becton, Dickinson and Company. Blood culture system. 4,812,408, Cl. 435-296.000.

Hammond, Martin B.: *See*—
Tatomir, Paul J.; and Hammond, Martin B., 4,812,790, Cl. 333-212.000.

Hanabata, Makoto: *See*—
Oi, Fumio; Osaki, Haruyoshi; Furuta, Akihiro; Uemura, Yukikazu; Ninomiya, Takao; Uetani, Yasunori; and Hanabata, Makoto, 4,812,551, Cl. 528-129.000.

Hanabusa, Kazunori: *See*—
Yamada, Takeshi; Fujimoto, Hidetoshi; Ito, Kenzo; and Hanabusa, Kazunori, 4,812,980, Cl. 364-449.000.

Hanai, Kazuko; Yamada, Yasuyuki; and Miyoshi, Takahito, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,812,369, Cl. 428-425.900.

Hanazawa, Hideaki; Mori, Makoto; Sasaki, Katsumi; and Inagaki, Katsumi, to National Starch and Chemical Corporation. Emulsion-type rust preventive baking composition. 4,812,327, Cl. 427-388.400.

Hancock, Warren J., to Pacific Dunlop Limited. Handling limp fabric. 4,811,671, Cl. 112-121.260.

Handlin, Dale L., Jr., to Shell Oil Company. Molecularly miscible blends of polyketone with polyvinyl phenol. 4,812,522, Cl. 525-155.000.

Hanna, Jun-Ichi: *See*—
Hirooka, Masaaki; Ueki, Masao; Hanna, Jun-Ichi; and Shimizu, Isamu, 4,812,331, Cl. 427-255.100.

Hanna, Junichi: *See*—
Ishihara, Shunichi; Hanna, Junichi; and Shimizu, Isamu, 4,812,325, Cl. 427-69.000.
Saitoh, Keishi; Hirooka, Masaaki; Hanna, Junichi; and Simizu, Isamu, 4,812,328, Cl. 427-69.000.

Hansch, Egon, to Ferag AG. Apparatus for collating folded printed signatures. 4,811,938, Cl. 270-54.000.

Hansen, Hardy V. Method for producing covering plate members for door or panel elements. 4,812,188, Cl. 156-220.000.

Hansen, John H., to Burlington Industries, Inc. Flame-resistant nylon/-cotton fabric and process for production thereof. 4,812,144, Cl. 8-584.000.

Hanson, Gary E.: *See*—
Chan, C. S.; Hanson, Gary E.; and Nelson, Terry M., 4,812,859, Cl. 346-140.00R.

Hansson, Maria. Decorative display and storage case. 4,811,996, Cl. 312-132.000.

Hanwa Electronic Co., Ltd.: *See*—
Toshiyuki, Nakaie; and Tethuo, Oonishi, 4,812,755, Cl. 324-158.00F.

Harada, Susumu: *See*—
Kageno, Kenji; Ueda, Toshio; and Harada, Susumu, 4,812,540, Cl. 526-218.100.

Harada, Toru; and Iwakura, Ken, to Fuji Photo Film Co., Ltd. Recording material containing leuco dye. 4,812,440, Cl. 503-223.000.

Haraguchi, Eiji: *See*—
Ito, Akio; Sawa, Hidenori; Sugisaka, Hiroshi; Hayashi, Shigeaki; Nakagawa, Hiroto; Oono, Yasuteru; and Haraguchi, Eiji, 4,812,729, Cl. 318-732.000.

Harasim, Anton: *See*—
Dietrich, Klaus; and Harasim, Anton, 4,812,019, Cl. 350-355.000.

Harbers, Jr., H. C., to Escorp, Inc. Manually actuable, machine, readable menu card. 4,812,630, Cl. 235-448.000.

Harbuck, Donna D.: *See*—
Davidson, Charles F.; Shirts, Monte B.; and Harbuck, Donna D., 4,812,301, Cl. 423-440.000.
Harco Technologies Corporation: *See*—
Dimond, James; and Swackhammer, William, 4,812,212, Cl. 204-147.000.
Hardt, William G. Outer wall structure for buildings. 4,811,536, Cl. 52-250.000.
Hardy, Christopher J.: *See*—
Bottomley, Paul A.; Hardy, Christopher J.; O'Donnell, Matthew; and Roemer, Peter B., 4,812,760, Cl. 324-309.000.
Hargis, Colin: *See*—
Roberts, Ian A.; and Hargis, Colin, 4,812,751, Cl. 324-546.000.
Hargrove, Homer G.: *See*—
Silvestri, George J., Jr.; and Hargrove, Homer G., 4,811,566, Cl. 60-646.000.
Hariguchi, Yoshinori: *See*—
Takatsuka, Masanori; and Hariguchi, Yoshinori, 4,811,947, Cl. 273-73.00J.
Harnisch, Horst; and Raue, Roderich, to Bayer Aktiengesellschaft. Electrophotographic toners containing an additive reinforcing the cationic charge. 4,812,379, Cl. 430-110.000.
Harnoy, Gideon N.; Gatt, Shimon; and Barenholtz, Yechezkel. Enhanced oil recovery. 4,811,791, Cl. 166-305.100.
Harper, Homer C.: *See*—
Cocherell, Francis E.; Harper, Homer C.; and Hsieh, George, 4,812,306, Cl. 424-52.000.
Harrigan, Michael E., to Xerox Corporation. Wide angle zoom lens. 4,812,021, Cl. 350-425.000.
Harris Corp.: *See*—
Boan, Bobby J.; and Schwam, Martin, 4,812,854, Cl. 343-897.000.
Witt, Terence R., 4,812,962, Cl. 364-490.000.
Harris, Frank W.: *See*—
Kiekhaefer, John H.; Perko, Jack E.; Hetzer, Joseph S.; and Harris, Frank W., 4,812,343, Cl. 428-35.600.
Harris, John L. Flush tank water saver. 4,811,432, Cl. 4-325.000.
Harris, Kendall R.; Spriggs, Leonard C.; and Block, Ralph J., to B&B Progessive Material & Technologies, Inc. Fire resistant flexible seal. 4,811,529, Cl. 52-396.000.
Harris, Stephen H., to Arco Chemical Technology, Inc. Preparation of unsaturated polyesters using bis-hydroxyalkyl esters of aromatic dicarboxylic acids. 4,812,553, Cl. 528-272.000.
Harrison, W. W.: *See*—
Marcus, R. Kenneth; and Harrison, W. W., 4,812,040, Cl. 356-314.000.
Harsco Corporation: *See*—
Mueller, Helmar A., 4,812,122, Cl. 434-18.000.
Hart, Kyle E.: *See*—
Horan, Thomas R.; and Hart, Kyle E., 4,811,568, Cl. 62-200.000.
Hart, William W. C.: *See*—
Rothgery, Eugene F.; Hart, William W. C.; Smith, Edward F., III; Phillips, Steven D.; Sandel, Bonnie B.; and Gavin, David F., 4,812,896, Cl. 357-70.000.
Harttig, Erich H.; Buck, Reinhold J.; and Gohl, Hermann J., to Gambro Dialysatoren KG. Process for producing hollow fiber semi-permeable membranes. 4,812,269, Cl. 264-41.000.
Hartung, Karl-Heinz, to Draegerwerk AG. Protective breathing apparatus having breathing air circulation. 4,811,732, Cl. 128-204.260.
Hase, Hiroyuki: *See*—
Yamashita, Ichiro; Wakamiya, Masayuki; Hase, Hiroyuki; and Tokuono, Shinya, 4,812,758, Cl. 324-209.000.
Hasegawa, Hiroaki; Miyata, Yasuji; Sugimoto, Koyata; and Nakamura, Akira, to Tokico, Ltd. Mass flowmeter. 4,811,606, Cl. 73-861.380.
Hasegawa, Kazuo; Ohuchi, Junichi; and Sasaki, Hiroaki, to Alps Electric Co., Ltd. Optical coordinate system input device. 4,812,642, Cl. 250-221.000.
Hasegawa, Morihiro: *See*—
Yamauchi, Takashi; Hasegawa, Morihiro; and Akiyama, Ryuichi, 4,811,780, Cl. 164-428.000.
Hashimoto Corporation: *See*—
Hashimoto, Kazuo, 4,813,067, Cl. 379-67.000.
Hashimoto, Kazuo, 4,813,068, Cl. 379-70.000.
Hashimoto, Fumiharu: *See*—
Yamamoto, Yoshihiro; Kume, Tsutomu; Yamazaki, Nobuo; Hashimoto, Fumiharu; and Ohya, Koichi, 4,812,773, Cl. 328-167.000.
Hashimoto, Hiroshi: *See*—
Okita, Tsutomu; Aozuma, Masashi; and Hashimoto, Hiroshi, 4,812,351, Cl. 428-141.000.
Hashimoto, Kazuo, to Hashimoto Corporation. Apparatus for connecting selectively a telephone answering device or additional equipment, such as a facsimile machine, to telephone lines. 4,813,067, Cl. 379-67.000.
Hashimoto, Kazuo, to Hashimoto Corporation. Easily operable automatic telephone answering/recording apparatus. 4,813,068, Cl. 379-70.000.
Hassel, William; and Mee, William, to Verimed, Inc. Proportional response electrical muscle stimulation. 4,811,742, Cl. 128-733.000.
Hata, Yasuhisa; and Akamatsu, Osamu, to Nippon Air Brake Co., Ltd. Spring brake cylinder. 4,811,651, Cl. 92-29.000.
Hata, Yasuhisa; and Kitaue, Masaaki, to Nippon Air Brake Co., Ltd. Arrangement for controlling the removal of moisture from a two-cylinder type moisture remover. 4,812,148, Cl. 55-162.000.
Hata, Yoshiaki: *See*—
Taniguchi, Nobuyuki; Hata, Yoshiaki; Kudo, Yoshinobu; Inoue, Manabu; Hoda, Takeo; and Ueda, Hiroshi, 4,812,871, Cl. 354-421.000.
Hatakeyama, Atsushi; Izumi, Masaki; and Ohmori, Seishi, to Eastman Kodak Company. Sheet securing mechanism. 4,812,064, Cl. 400-622.000.
Hatanaka, Chitoshi: *See*—
Meguro, Kanji; Fujita, Takeshi; Hatanaka, Chitoshi; and Ooi, Satoru, 4,812,570, Cl. 546-280.000.
Hatano, Takashi: *See*—
Okada, Sumie; Nara, Takashi; Hatano, Takashi; Kawato, Yutaka; Shimozono, Ryoji; Tsutsumi, Kenji; Ogawa, Yasunori; and Tanaka, Yasuo, 4,812,839, Cl. 340-825.140.
Hatch, Ronald R., to Magnavox Govt. and Industrial Electronics Company. Method for precision dynamic differential positioning. 4,812,991, Cl. 364-458.000.
Hatfield, R. Andrew, to AVCOM of Virginia, Inc. Spectrum analyzer and logarithmic amplifier therefor. 4,812,772, Cl. 328-145.000.
Hathaway, Roger C.; and Srivastava, Gopal K., to Zenith Electronics Corporation. Sync pulse separator system. 4,812,907, Cl. 358-153.000.
Hattori, Shintaroo: *See*—
Ohara, Shuichi; Akasaka, Sinichi; Oka, Hiroyuki; and Hattori, Shintaroo, 4,812,439, Cl. 503-227.000.
Hattori, Takemi; and Kume, Hirofumi, to Aisin Seiki Kabushiki Kaisha. Adjustable lumbar support. 4,811,986, Cl. 297-284.000.
Hattori, Yoshihiro: *See*—
Inagaki, Sanji; Fukao, Hiroshi; Yamada, Tetsuya; Urano, Etsuaki; and Hattori, Yoshihiro, 4,812,873, Cl. 355-3.0FU.
Hatzikazakis, Michael: *See*—
Etemad, Shahrokh; Yannascoli, Donald; and Hatzikazakis, Michael, 4,811,471, Cl. 29-156.40R.
Haubennestel, Karlheinz; and Bubat, Alfred, to BYK-Chemie GmbH. Polyester group containing polysiloxanes for lacquers and molding compositions. 4,812,518, Cl. 525-100.000.
Hauck, Paul L.: *See*—
Linzer, Frederick D.; and Hauck, Paul L., 4,811,783, Cl. 165-134.100.
Hautemont, Jean-Claude, to Erca Holding. Method and device for manufacturing and positioning upon a container an undercut thermoplastic lid, and container provided with such a lid. 4,811,550, Cl. 53-478.000.
Havel, Dale A.: *See*—
Jackson, David, III; and Havel, Dale A., 4,813,064, Cl. 378-197.000.
Havel, Karel. Variable color analog voltmeter. 4,812,744, Cl. 324-115.000.
Hayaishi, Osamu: *See*—
Narumiya, Shuh; Hayaishi, Osamu; Kimura, Yoshiharu; and Tsuboshima, Masami, 4,812,457, Cl. 514-226.200.
Hayakawa, Futomi; and Onoda, Kazuo, to Hy-Bec Corporation. Concentrated radiant energy heat source unit. 4,812,620, Cl. 219-347.000.
Hayakawa, Hideyuki: *See*—
Yamada, Motokazu; Hayakawa, Hideyuki; Fukui, Tomonori; Matsuhashi, Hajime; Kaneko, Yasuhiro; Ikeda, Motozo; and Nagata, Tomihiko, 4,812,845, Cl. 340-995.000.
Hayakawa, Iwao: *See*—
Shibata, Masashi; Hayakawa, Iwao; and Hayashibara, Tokimasa, 4,812,339, Cl. 428-15.000.
Hayashi, Shigeaki: *See*—
Ito, Akio; Sawa, Hidenori; Sugisaka, Hiroshi; Hayashi, Shigeaki; Nakagawa, Hiroto; Oono, Yasuteru; and Haraguchi, Eiji, 4,812,729, Cl. 318-732.000.
Hayashibara, Ken: *See*—
Masaki, Kazumi, 4,812,804, Cl. 338-200.000.
Hayashibara, Tokimasa: *See*—
Shibata, Masashi; Hayakawa, Iwao; and Hayashibara, Tokimasa, 4,812,339, Cl. 428-15.000.
Hayashida, Tetsuya: *See*—
Nakamura, Tohru; Nakazato, Kazuo; Homma, Noriyuki; Sagara, Kazuhiko; Shiba, Takeo; Kure, Tokuo; and Hayashida, Tetsuya, 4,812,894, Cl. 357-55.000.
Hayden, Earl E., to Shell Oil Company. Polyolefin compositions for water pipes and for wire and cable coatings. 4,812,500, Cl. 524-99.000.
Hayes, Richmond S., Jr.: *See*—
Jennings, William B.; Thompson, John; and Hayes, Richmond S., Jr., 4,811,570, Cl. 62-263.000.
HCC-EDE B.V.: *See*—
Slikker, Dick, 4,811,833, Cl. 198-499.000.
He, Guangchu: *See*—
Fang, Hongsheng; Zhao, Rufa; Zheng, Yankang; Chen, Ziuyun; He, Guangchu; Gu, Jisoyou; Zhu, Mingang; Zhang, Zhixin; and Tong, Keging, 4,812,182, Cl. 148-330.000.
Health Research Inc.: *See*—
Turner, James N., 4,812,412, Cl. 436-15.000.
Hebel, James B., to Smith International, Inc. Weight-on-bit and torque measuring apparatus. 4,811,597, Cl. 73-151.000.
Heber, Klaus, to Daimler-Benz Aktiengesellschaft. Automatic shift device for an epicyclic change-speed gear having means for blocking the engagement of a reverse gear clutch and/or reverse gear brake. 4,811,630, Cl. 74-752.00A.
Heck, Michael E., to Phillips Plastics Corporation. Apparatus for supplying and installing plastic expansion rivets. 4,811,881, Cl. 227-4.000.
Hefftler, Victor; Johne, Hans; Schulz, Horst; Jentzsch, Arndt; and Schone, Helmut, to Veb Kombinat Polygraph "Werner Lamberz" Leipzig. Driving system for sheet-fed rotary printing machine. 4,811,663, Cl. 101-183.000.
Heggart, Ronald G.; McClintock, Willard K.; and Engstrom, Randy J., to Union Carbide Corporation. Furnace cooling system and method. 4,813,055, Cl. 373-74.000.

Heidelberger Druckmaschinen Aktiengesellschaft: *See*—
Muller, Hans, 4,811,641, Cl. 83-105.000.
Heideman, Robert C., to Amco Corporation. Modular luggage carrier with sliding tie-down bracket stabilized against luggage-securing forces. 4,811,877, Cl. 224-321.000.
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Heinrich, Jurgen; and Bohmer, Manfred, to Duetsche Forchungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Process by compacting a porous structural member for hot isostatic pressing. 4,812,272, Cl. 264-65.000.
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Helferich, Richard L.; and Schenck, Robert C., to Duriron Company, Inc., The. Kiln furniture for the firing of ceramic articles. 4,812,424, Cl. 501-84.000.
Helsley, Grover C.; Davis, Larry; and Olsen, Gordon E., to Hoechst-Roussel Pharmaceuticals Inc. 1-(N-(2-alkylthio-10H-phenothiazin-10-yl)alkyl)-4-benzoylpiperidines and pharmaceutical use. 4,812,456, Cl. 514-225.500.
Hemmann, Ronald S., to Coleco Industries, Inc. Folding case and game board assembly. 4,811,954, Cl. 273-283.000.
Hempel, Ulrich, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Lid for closing an automobile body recess. 4,811,984, Cl. 296-97.220.
Hendericksen, Carl. Device for mixing two materials. 4,812,046, Cl. 366-111.000.
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Henkel, Dietmar, to Man Nutzfahrzeuge GmbH. Apparatus for removing soot from the exhaust gases of an internal combustion engine. 4,811,559, Cl. 60-303.000.
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Hensley, James C. Trailer hitch. 4,811,967, Cl. 280-479.300.
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Herb, Carl C.: *See*—
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Gillette, Paul C., 4,812,519, Cl. 525-106.000.
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Nelson, Lawrence L., 4,812,260, Cl. 252-378.00R.
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Hernandez, Samson V. Dental hygiene teaching tool and storage device. 4,812,127, Cl. 434-264.000.
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Herzog, Helmut; Schutze, Detlef-Ingo; Schneider, Jurgen; and Schmitz, Reinold, to Bayer Aktiengesellschaft. Process for the preparation of 6,13-dihydroquinacridones and quinacridones. 4,812,568, Cl. 546-49.000.
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Heubeck, Erich; Gunther, Werner; Muther, Manfred; and Werner, Leonhard, to Siemens Aktiengesellschaft. Dental x-ray diagnostic apparatus for producing panorama tomograms of the jaw of a patient. 4,813,060, Cl. 378-39.000.
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Hewig, Gerd; Schum, Berthold; and Worner, Jorg. Method for executing a reproducible glow discharge. 4,812,416, Cl. 437-5.000.
Hewitt, William B. Method of mixing dental impression materials and device therefor. 4,812,119, Cl. 433-49.000.
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Nazarathy, Moshe; Newton, Steven A.; and Foster, Scott H., 4,812,038, Cl. 356-73.100.
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Heywang, Walter, to Siemens Aktiengesellschaft. Arrangement for coupling a laser diode and a monomode light waveguide having a feedback means. 4,812,005, Cl. 350-96.200.
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Hill, Guy J.; Smith, Homer G., Jr.; Schnitker, Mark W.; and Beatty, Glenn E., to Homco International Inc. Flexiable drill string member especially for use in directional drilling. 4,811,800, Cl. 175-323.000.
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Ho, Wan-Lan. Method of indexing a dictionary and the index system thereof. 4,811,974, Cl. 283-67.000.

Hochholzer, Reinhard, to Wilhelm Ruf A.G. Rotary potentiometer, especially for use as a rotational position sensor to detect the angular position of a shaft. 4,812,803, Cl. 338-175.000.

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Hofmann, Klaus; Buhler, Ulrich; and Dietz, Erwin, to Cassella Aktiengesellschaft. Liquid formulations of disperse dyestuffs containing inorganic oxides or silicates for dyeing textile materials. 4,812,143, Cl. 8-528.000.

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Holt, William, to Alarm Accessory, Ltd. Pendulum alarm sensor. 4,812,824, Cl. 340-566.000.

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Kadowaki, Hidejiro; Hosaka, Akihito; and Matsumoto, Kenichi, 4,812,900, Cl. 358-75.000.
Hosaka, Hideo: *See*—
Hagiwara, Kenji; Ishikawa, Hisao; Hosaka, Hideo; and Inaba, Hideo, 4,812,161, Cl. 71-90.000.
Hoshino Gakki Co., Ltd.: *See*—
Hoshino, Yoshihiro, 4,811,646, Cl. 84-313.000.
Hoshino, Yoshihiro, to Hoshino Gakki Co., Ltd. Holding structure for the tremolo of a guitar. 4,811,646, Cl. 84-313.000.
Hoshizaki Electric Co., Ltd.: *See*—
Suyama, Koji; and Yoshida, Akiyoshi, 4,811,997, Cl. 312-228.000.
Takeda, Yukimasa; and Wakatuki, Yuji, 4,812,622, Cl. 219-400.000.
Hosokawa, Hitoshi: *See*—
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Hosokawa Micron Corporation: *See*—
Inoki, Masahiro, 4,811,909, Cl. 241-33.000.
Hosokawa, Yasunori; and Kobayashi, Takatoshi, to Kao Corporation. Absorbent resin with excellent stability. 4,812,486, Cl. 521-139.000.
House, Roy D. Educational device and game. 4,812,123, Cl. 434-195.000.
Hovanchak, John A., to TRW Inc. Center take-off electric rack and pinion steering gear. 4,811,813, Cl. 180-79.100.
Howard, James W.: *See*—
Jungkman, David L.; Howard, James W.; and White, Timothy E., 4,812,655, Cl. 250-352.000.
Howard, William A., to Delta Systems, Inc. Torsion spring contact switch. 4,812,604, Cl. 200-260.000.
Howarth, Michael S.; and Tomkinson, David M., to Imperial Chemical Industries PLC. Process for preparation of fluoroaromatic or fluoroheterocyclic compounds. 4,812,572, Cl. 546-290.000.
HR Textron, Inc.: *See*—
Seleman, Don J.; and Honzik, Roy F., 4,812,235, Cl. 210-247.000.
Hsieh, George: *See*—
Cocherell, Francis E.; Harper, Homer C.; and Hsieh, George, 4,812,306, Cl. 424-52.000.
Hsu, Chi-Chu: *See*—
Huang, Mijuel E. J.; Chao, Suyueh; Yu, Chin-Ching; and Hsu, Chi-Chu, 4,811,495, Cl. 34-131.000.
Hsu, Joseph C.; and Steen, Robert A., to American National Can Company. Method for making package having oil-containing product. 4,812,319, Cl. 426-127.000.
Huang, Mijuel E. J.; Chao, Suyueh; Yu, Chin-Ching; and Hsu, Chi-Chu. Laundry drier. 4,811,495, Cl. 34-131.000.
Huber, Jurgen: *See*—
Kleeberg, Wolfgang; Hacker, Heinz; Huber, Jurgen; Wilhelm, Dieter; and Laupenmuhlen, Heinz K., 4,812,490, Cl. 523-443.000.
Huber, Lothar: *See*—
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Hughes Aircraft Company: *See*—
Ajioka, James S., 4,812,782, Cl. 330-286.000.
Burns, Richard J.; Grim, Kenneth R.; and Levy, Miguel E., 4,813,006, Cl. 364-604.000.
Byren, Robert W.; and Rockwell, David A., 4,812,639, Cl. 250-203.00R.
Lee, Kuan M., 4,812,789, Cl. 333-135.000.
Tatomir, Paul J.; and Hammond, Martin B., 4,812,790, Cl. 333-212.000.
Wong, Mon N.; Patin, Robert J.; Fishkin, Theodore S.; and Chang, Donald C. D., 4,812,788, Cl. 333-113.000.
Hulsing, Rand H., to Sundstrand Data Control, Inc. Frame assembly and dither drive for a coriolis rate sensor. 4,811,602, Cl. 73-505.000.
Hulsing, Rand H., II, to Sundstrand Data Control, Inc. Borehole survey system utilizing strapdown inertial navigation. 4,812,977, Cl. 364-422.000.
Humphreys, Robert E.; and Gray, Steven M., to Royal Technology, Inc. Telephone intercept system. 4,813,070, Cl. 379-213.000.
Humphries, John R., to EMI Limited. Process for producing an inorganic foam. 4,812,170, Cl. 106-122.000.
Hunter Engineering Company, Inc.: *See*—
Romanowski, Christopher A.; and Landero, Herman, 4,811,781, Cl. 164-480.000.
Hupfer, Leopold: *See*—
Hoelderich, Wolfgang; Goetz, Norbert; and Hupfer, Leopold, 4,812,593, Cl. 560-183.000.
Hurd, Stanley M.; and Kouri, Richard E., to Bios Corporation. Method of handling and transporting a transfer membrane used in a blotting apparatus. 4,812,216, Cl. 204-182.800.
Husain, Altaf; and Sandler, Stanley R., to Pennwalt Corporation. Process for the conversion of t-alkylphenol waste distillation bottoms to para-t-alkylphenol. 4,812,596, Cl. 568-788.000.
Huss, Michael: *See*—
Stober, Reinhard; Fischer, Wolfgang; Huss, Michael; and Udluft, Klaus, 4,812,257, Cl. 252-182.320.
Hutschenreuther AG: *See*—
Pohlmann, Hans-Jurgen; and Strobel, Klaus, 4,812,434, Cl. 502-178.000.
Huvey, Michel, to Institit Francais du Petrole. Flexible tube for carrying heating or refrigerant fluids. 4,811,761, Cl. 138-122.000.
Hwang, Chi Y.; and Chih, Liu P. Mini inflatable yacht. 4,811,682, Cl. 114-345.000.
Hwang, Edward Y., to Westinghouse Electric Corp. Steam turbine valve management system. 4,811,565, Cl. 60-646.000.
Hy-Bec Corporation: *See*—
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Hydro-Quebec: *See*—
Alexandrov, Nicolas; Chretien, Normand; and Fihey, Jean-Luc, 4,812,608, Cl. 219-10.750.
Hynninen, Pertti: *See*—
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Odorisio, Paul A.; Pastor, Stephen D.; and Hyun, James L., 4,812,501, Cl. 524-117.000.
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I, Yoshihiro: *See*—
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Ice-Pack Service AG: *See*—
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Ichijima, Seiji: *See*—
Sakanoue, Kei; Ichijima, Seiji; and Kishimoto, Shinzo, 4,812,389, Cl. 430-382.000.
Ichijyo, Hiroshi, to Kabushiki Kaisha Kenwood. Sweep circuit for oscilloscope. 4,812,717, Cl. 315-367.000.
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Hiramatsu, Toshiyuki; Azuma, Shizuo; Nakagawa, Koji; and Ichikawa, Yataro, 4,812,163, Cl. 71-92.000.
Ichimura, Takeo: *See*—
Kodama, Hiroyuki; Mangyo, Katsumi; and Ichimura, Takeo, 4,812,423, Cl. 501-55.000.
Ide, Motoki; and Sato, Toshifumi, to NEC Corporation. Display radio pager having graphic alarm for selective indication of memory availability factors. 4,812,813, Cl. 340-311.100.
Idemitsu Kosan Company Limited: *See*—
Matsuo, Shigeru; Murakami, Tomoyoshi; Bando, Thoru; and Nagatoshi, Kikuo, 4,812,507, Cl. 524-611.000.
Yabe, Takao, 4,812,246, Cl. 252-32.70E.
Ihmels, Hartmut: *See*—
Ihmels, Manfred; and Ihmels, Hartmut, 4,811,904, Cl. 239-345.000.
Ihmels, Manfred; and Ihmels, Hartmut. Spray medium inset for spraying pistols and a spraying pistol suitable for application of such insets. 4,811,904, Cl. 239-345.000.
Iida, Michihiro: *See*—
Kakuta, Yonehiro; Takigawa, Kouichi; Noji, Akio; Kuwabara, Shigeaki; Shimada, Tadashi; and Iida, Michihiro, 4,811,492, Cl. 33-366.000.
Iida, Takashi; Itoh, Masatoshi; Fukuoka, Hidenori; Tsukamoto, Takeya; Hamada, Masataka; Ishibashi, Kenji; and Ootsuka, Hiroshi, to

Minolta Camera Kabushiki Kaisha. Focus detection condition display device for camera. 4,812,912, Cl. 358-227.000.
Iida, Takeaki; and Kawabe, Takeshi, to Unitika, Ltd. Enzyme sensor for determining a concentration of glutamate. 4,812,220, Cl. 204-403.000.
Iima, Mitsunori, to Asahi Kogaku Kogyo Kabushiki Kaisha. Telephoto lens system. 4,812,026, Cl. 350-454.000.
Iimuro, Shunichi: *See*—
Sakai, Hiroyuki; Yoshioka, Kazutoshi; Matsumura, Kimiharu; Shigaki, Keisuke; Amemiya, Yutaka; Iimuro, Shunichi; Yoshioka, Haruhiko; and Onoe, Teruhiko, 4,812,201, Cl. 156-643.000.
Iizuka, Tetsuya: *See*—
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Iizuka, Toshimi; and Kamata, Shigeru, to Canon Kabushiki Kaisha. Lens barrel. 4,812,015, Cl. 350-252.000.
Iizuka, Yo; Iwasaki, Takao; Katto, Takayuki; and Shiiki, Zenya, to Kureha Kagaku Kogyo Kabushiki Kaisha. Polyaryiene sulfide preparation in titanium reaction vessel with two distinct temperature ranges. 4,812,539, Cl. 526-62.000.
Ikeda, Hiroshi; Umemura, Shinichiro; and Katakura, Kageyoshi, to Hitachi Medical Corp. Ultrasonic diagnosis apparatus capable of probe exchange. 4,811,740, Cl. 128-660.010.
Ikeda, Kazuo: *See*—
Takeda, Masatoshi; Ikeda, Kazuo; Tominaga, Yoshiharu; and Mori, Kenji, 4,812,669, Cl. 307-105.000.
Ikeda, Motozo: *See*—
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Ikeda, Yoshie: *See*—
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Ikedo, Masaru: *See*—
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Ikegami, Kasumi: *See*—
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Imai, Akio: *See*—
Takao, Hiroyoshi; Yoshida, Nabuyuki; Imai, Akio; Tsuji, Mitsuji; and Saito, Yuichi, 4,812,527, Cl. 525-250.000.
Imai, Shozaburo; Isobe, Michihisa; Yokoo, Kazuhiro; and Matsuura, Hideaki, to Sumitomo Chemical Company, Limited. Optical disk substrate. 4,812,345, Cl. 428-65.000.
Imai, Tamotsu; and Bricker, Jeffery C., to UOP Inc. Dehydrogenation of dehydrogenatable hydrocarbons. 4,812,597, Cl. 585-443.000.
Immel, Erich. Powered load carrier. 4,811,988, Cl. 298-2.000.
Imperial Chemical Industries PLC: *See*—
Anthony, Vivienne M.; Clough, John M.; Godfrey, Christopher R. A.; and de Fraine, Paul J., 4,812,162, Cl. 71-90.000.
Howarth, Michael S.; and Tomkinson, David M., 4,812,572, Cl. 546-290.000.
Imwinkelried, Rene ; and Seebach, Dieter, 4,812,476, Cl. 562-470.000.
Whittle, Alan J., 4,812,483, Cl. 514-721.000.
Imwinkelried, Rene ; and Seebach, Dieter, to Imperial Chemical Industries PLC. Process for stereosectively preparing optically active compounds. 4,812,476, Cl. 562-470.000.
Ina, Toshikazu: *See*—
Tashiro, Syuzaburou; Ina, Toshikazu; Nakano, Osamu; Taguchi, Masahiro; Onimaru, Sadahisa; and Kuno, Akira, 4,812,838, Cl. 340-825.060.
Inaba, Hideo: *See*—
Hagiwara, Kenji; Ishikawa, Hisao; Hosaka, Hideo; and Inaba, Hideo, 4,812,161, Cl. 71-90.000.
Inagaki, Hiromi; Matsuura, Kazuo; Koike, Tetsuya; Suenaga, Toshihiko; Yorita, Masaru; and Izawa, Masaki, to Honda Giken Kogyo Kabushiki Kaisha. Fluid-filled bushing. 4,811,933, Cl. 267-140.100.
Inagaki, Katsumi: *See*—
Hasazawa, Hideaki; Mori, Makoto; Sasaki, Katsumi; and Inagaki, Katsumi, 4,812,327, Cl. 427-388.400.
Inagaki, Sanji; Fukao, Hiroshi; Yamada, Tetsuya; Urano, Etsuaki; and Hattori, Yoshihiro, to Minolta Camera Kabushiki Kaisha. Heat fixing unit in an electrophotographic copying apparatus. 4,812,873, Cl. 355-3.0FU.
Industrial Technology Research Institute: *See*—
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Industrimekanik I Stockholm AB: *See*—
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Ing. Walter Hengst GmbH & Co. KG: *See*—
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Inoex GmbH Innovationen und Austrustungen Fur Die Extrusionstechnik: *See*—
Neumann, Ulrich; and Wolfl, Volkmar, 4,812,048, Cl. 366-141.000.
Inoki, Masahiro, to Hosokawa Micron Corporation. Ball mill. 4,811,909, Cl. 241-33.000.
Inooka, Masayoshi, to Chiyoda Corporation. Process for recovering metallic gallium from gallium compound-containing waste. 4,812,167, Cl. 75-63.000.
Inoue, Manabu: *See*—
Taniguchi, Nobuyuki; Hata, Yoshiaki; Kudo, Yoshinobu; Inoue, Manabu; Hoda, Takeo; and Ueda, Hiroshi, 4,812,871, Cl. 354-421.000.
Inoue, Takayuki, Kazuko Inoue, heirs: *See*—
Ogata, Nobuo; Nakata, Yasuo; Satou, Hideaki; Tanaka, Toshiyuki; Minami, Etsuji; Yoshida, Yoshio; Kurata, Yukio; and Inoue, Teruaki, deceased, 4,812,638, Cl. 250-201.000.
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Ogata, Nobuo; Nakata, Yasuo; Satou, Hideaki; Tanaka, Toshiyuki; Minami, Etsuji; Yoshida, Yoshio; Kurata, Yukio; and Inoue, Teruaki, deceased, 4,812,638, Cl. 250-201.000.
Inoue, Yasuo, to Mitsubishi Denki Kabushiki Kaisha. Stress evaluation apparatus. 4,812,036, Cl. 356-32.000.
Inoue, Yoshiaki: *See*—
Okochi, Kastuhiko; Toya, Mitsuo; Naito, Masahito; Inoue, Yoshiaki; and Egusa, Takahiro, 4,812,997, Cl. 364-505.000.
Institit Francais du Petrole: *See*—
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Ambrosino, Jean-Louis; Cohen, Choua; Cheron, Jacques; and Rouey, Alexandre, 4,812,250, Cl. 252-67.000.
Intermetro Industries Corporation: *See*—
Koivites, Albert; and Brancher, Rodney E., 4,811,670, Cl. 108-107.000.
Intermodulation and Safety System AB: *See*—
Asbrink, Leif; and Graflind, Ulf, 4,812,811, Cl. 340-571.000.
International Business Machines Corporation: *See*—
Baasch, Holger J.; and Luecke, Francis S., 4,813,033, Cl. 369-45.000.
Chu, Albert M.; and Griffin, William R., 4,812,688, Cl. 307-605.000.
Chung, Paul W.; and Saber, Paik, 4,812,784, Cl. 331-113.00R.
Curtis, Huntington W.; Fung, Min-Su; and Verkuil, Roger L., 4,812,756, Cl. 324-158.00R.
Driscoll, Carleton D.; Najm, Elie M.; and Waechter, Manfred, 4,812,959, Cl. 363-20.000.
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Larson, Tony R.; and Tretter, Larry L., 4,812,687, Cl. 307-601.000.
Poole, Fred, 4,812,968, Cl. 364-200.000.
Smith, Theoren P., III, 4,812,886, Cl. 357-22.000.
International Business Machines Corportion: *See*—
Wong, Robert C., 4,813,017, Cl. 365-156.000.
International Paper Company: *See*—
Waldman, Harold L.; Green, Charles B.; Fowler, A. Frederick; and Farr, William F., 4,811,428, Cl. 2-49.00R.
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Disbrow, Richard A.; and Blanchard, Russel O., 4,811,945, Cl. 272-73.000.
Iorio, Theodore L., to Copley Pharmaceuticals, Inc. High dose calcium tablet. 4,812,303, Cl. 424-44.000.
Ise, Kiyotaka: *See*—
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Isenberg, Arnold O., to Westinghouse Electric Corp. Method of making sulfur tolerant composite cermet electrodes for solid oxide electrochemical cells. 4,812,329, Cl. 427-115.000.
Ishibashi, Kenji: *See*—
Iida, Takashi; Itoh, Masatoshi; Fukuoka, Hidenori; Tsukamoto, Takeya; Hamada, Masataka; Ishibashi, Kenji; and Ootsuka, Hiroshi, 4,812,912, Cl. 358-227.000.
Ishida, Toru: *See*—
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Ishihara, Shunichi; Hanna, Junichi; and Shimizu, Isamu, to Canon Kabushiki Kaisha. Method for forming a deposited film. 4,812,325, Cl. 427-69.000.
Ishihara, Takeshi: *See*—
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Ishii, Keizou: *See*—
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Ishii, Kenji: *See*—
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Ishii, Ryutaro, to Bridgestone Corporation. Apparatus for sticking rubber sheet material. 4,812,196, Cl. 156-412.000.
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Nishi, Kazuhiko; Ishii, Takatoshi; Yamashita, Ryozo; Yamaoka, Shigemitsu; and Okumura, Takatoshi, 4,812,828, Cl. 340-706.000.
Ishii, Tamaki: *See*—
Nagasaki, Hideo; Yachigo, Shinichi; Ishii, Tamaki; Yoshimura, Masakatsu; Takahashi, Yukoh; and Yamamoto, Hiroki, 4,812,494, Cl. 524-91.000.
Ishikawa, Hisao: *See*—
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Ishikawa, Hisashi: *See*—
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Ishikawa, Kazuo; and Nishi, Yoshinori, to Aisin Seiki Kabushiki Kaisha. Lock-up clutch control method in automatic transmissions for automotive vehicles. 4,811,827, Cl. 192-0.076.

Ishikawa, Ryosuke: *See*—
Tamura, Kinichi; Kawada, Susumu; Sekine, Yoshitada; Abe, Kazuyoshi; Ishikawa, Ryosuke; and Yokota, Fumiki. 4,811,935, Cl. 269-34.000.

Ishikawa, Tooru; and Kosuge, Tokuo, to Hitachi, Ltd. Electromagnetic fuel injector. 4,811,905, Cl. 239-585.000.

Ishikawa, Yasuyuki, to Canon Kabushiki Kaisha. Ophthalmic apparatus. 4,812,033, Cl. 351-208.000.

Ishikura, Tomoyuki: *See*—
Yoshioka, Takeo; Chida, Noritaka; Watanabe, Azuma; Fukagawa, Yasuo; and Ishikura, Tomoyuki, 4,812,563, Cl. 540-302.000.

Ishikuro, Tadashi; and Fujiyama, Masaaki, to Fuji Photo Film Co., Ltd. Process for producing a magnetic recording medium. 4,812,330, Cl. 427-128.000.

Ishimaru, Sueaki: *See*—
Shirakura, Osamu; Kojima, Hideo; Ouchi, Kiyohisa; and Ishimaru, Sueaki, 4,812,480, Cl. 514-557.000.

Ishinaga, Hiroyuki, to Canon Kabushiki Kaisha. Print hammer with flux detection for print pressure control. 4,812,062, Cl. 400-157.200.

Ishizaki, Akira: *See*—
Akashi, Akira; Ishizaki, Akira; Suda, Yasuo; Ohnuki, Ichiro; Ohtaka, Keiji; and Koyama, Takeshi, 4,812,869, Cl. 354-408.000.

Ishizuka, Susumu: *See*—
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Miura, Shinsuke; and Ishizuka, Susumu, 4,811,593, Cl. 73-54.000.

Ishizumi, Kukuo: *See*—
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Islam, Shafidul: *See*—
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Isobe, Makoto: *See*—
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Isobe, Michihisa: *See*—
Imai, Shozaburo; Isobe, Michihisa; Yokoo, Kazuhiro; and Matsuura, Hideaki, 4,812,345, Cl. 428-65.000.

Isobe, Minoru, to Oki Electric Industry Co., Ltd. Electronic print board apparatus. 4,812,914, Cl. 358-293.000.

Isobe, Mitsuo: *See*—
Matsui, Masataka; Iizuka, Tetsuya; Tsujimoto, Jun-ichi; Ohtani, Takayuki; and Isobe, Mitsuo, 4,813,022, Cl. 365-203.000.

Israel Aircraft Industries Ltd.: *See*—
Dravkin, David, 4,812,770, Cl. 328-67.000.

Istituto Guido Donegani, S.p.A.: *See*—
Santi, Roberto; Cometti, Giuseppe; and Pagani, Anselmo, 4,812,592, Cl. 560-180.000.

Itaya, Hiroshi; and Saito, Goro, to Anritsu Corporation. Apparatus for analyzing transmission/reflection characteristics. 4,812,738, Cl. 324-58.00B.

Ito, Akio; Sawa, Hidenori; Sugisaka, Hiroshi; Hayashi, Shigeaki; Nakagawa, Hiroto; Oono, Yasuteru; and Haraguchi, Eiji, to Hitachi Ltd.; and Kansai Electric, The. Protecting apparatus for secondary excitation type variable speed AC generator/motor. 4,812,729, Cl. 318-732.000.

Ito, Hitoshi: *See*—
Narita, Ryoichi; Sonobe, Toshio; Ito, Hitoshi; Ishikawa, Junji; Takenaka, Osamu; and Sugiura, Junji, 4,812,897, Cl. 357-72.000.

Ito, Kenzo: *See*—
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Ito, Masazumi: *See*—
Nishimori, Kadotaro; Ito, Masazumi; and Oyabu, Masaaki, 4,812,877, Cl. 355-14.00R.

Itoh, Masatoshi: *See*—
Iida, Takashi; Itoh, Masatoshi; Fukuoka, Hidenori; Tsukamoto, Takeya; Hamada, Masataka; Ishibashi, Kenji; and Ootsuka, Hiroshi, 4,812,912, Cl. 358-227.000.

Itoh, Masaya: *See*—
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Itoh, Tsutomu: *See*—
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Itow, Koichiro, to Kabushi Kaisha Komatsu Seisa Kusho. Air intake apparatus for use in diesel engine. 4,811,712, Cl. 123-399.000.

ITT Corporation: *See*—
Rofer, David; Hyzin, Peter J.; and Conrad, Thomas W., 4,812,129, Cl. 439-79.000.
Wilson, Albert H.; and Welsh, David E., 4,812,137, Cl. 439-607.000.

Iwabuchi, Takashi: *See*—
Miyata, Takeo; Ono, Takuhiro; Iwabuchi, Takashi; Ikedo, Masaru; and Watari, Masafumi, 4,812,016, Cl. 350-320.000.

Iwai, Isamu: *See*—
Okamoto, Toshio; Doi, Miwako; and Iwai, Isamu, 4,813,010, Cl. 364-900.000.

Iwaki, Tetsuo: *See*—
Yamawaki, Chiaki; Sasada, Taizo; Iwaki, Tetsuo; and Koyanagi, Katsubumi, 4,812,987, Cl. 364-724.010.

Iwakura, Ken: *See*—
Harada, Toru; and Iwakura, Ken, 4,812,440, Cl. 503-223.000.

Iwakura, Tomoatsu: *See*—
Nojiri, Naohiro; Sakai, Yukio; and Iwakura, Tomoatsu, 4,812,437, Cl. 502-243.000.

Iwama, Shinichi, to Daiwa Seiko, Inc. Ski boot. 4,811,503, Cl. 36-119.000.

Iwamoto, Hiroshi; Tamura, Yutaka; Mizuno, Yuji; and Yokota, Akihiro, to Dainippon Screen Mfg. Co., Ltd. Visual monitoring device which projects an image of a register mark onto a scanning surface for use in setting image processing conditions. 4,812,916, Cl. 358-289.000.

Iwamura, Masahiro; and Masuda, Ikuro, to Hitachi, Ltd. Semiconductor device. 4,813,020, Cl. 365-189.000.

Iwanaga, Katsusuke: *See*—
Koba, Keiichiro; Utsunomiya, Taizo; Saitow, Yoshiaki; Iwanaga, Katsusuke; Matsue, Michihiko; and Nishitani, Noriaki, 4,812,271, Cl. 264-63.000.

Iwao, Hirofumi: *See*—
Yamakawa, Tsutomu; and Iwao, Hirofumi, 4,812,656, Cl. 250-363.00R.

Iwasaki, Masayuki: *See*—
Mochizuki, Akihiro; Iwasaki, Masayuki; Yamagishi, Yasuo; Ikegami, Kasumi; Gondo, Hiroyuki; and Yamaguchi, Hisashi, 4,812,034, Cl. 383-122.000.

Iwasaki, Takao: *See*—
Iizuka, Yo; Iwasaki, Takao; Katto, Takayuki; and Shiiki, Zenya, 4,812,539, Cl. 526-62.000.

Iwasaki, Tetsuji; and Hosokawa, Hitoshi, to Kao Corporation. Caking-preventing agent for fertilizer. 4,812,158, Cl. 71-64.120.

Iwase, Yoshiki; and Kobayashi, Yasuhito, to Fuji Photo Film Co. Ltd. Field/frame conversion circuit. 4,812,919, Cl. 358-310.000.

Iwatani, Shiro, to Mitsubishi Denki Kabushiki Kaisha. Control device for an a. c. generator for an automobile. 4,812,732, Cl. 322-99.000.

Iwatschenko, Peter; Wolkenstrorfer, Wolfgang; Hofmann, Wolfgang; and Prell, Walter, to Pfrimmer-Viggo GmbH & Co. KG. Control clamp for infusion hoses. 4,811,928, Cl. 251-7.000.

Iyoda, Hiroumi: *See*—
Nakazawa, Hayashi; Iyoda, Hiroumi; and Ueta, Makoto, 4,811,829, Cl. 198-326.000.

Izawa, Masaki: *See*—
Inagaki, Hiromi; Matsuura, Kazuo; Koike, Tetsuya; Suenaga, Toshihiko; Yorita, Masaru; and Izawa, Masaki, 4,811,933, Cl. 267-140.100.

Izumi, Asashiro, to Kabushiki Kaisha Ishida Koki Seisakusho. Cover apparatus for weighing machines. 4,812,701, Cl. 312-285.000.

Izumi, Masaki: *See*—
Hatakeyama, Atsushi; Izumi, Masaki; and Ohmori, Seishi, 4,812,064, Cl. 400-622.000.

Izumi, Tatsuro: *See*—
Fujino, Akihiko; Ootsuka, Hiroshi; and Izumi, Tatsuro, 4,812,862, Cl. 354-21.000.

J. I. Case Company: *See*—
Cochran, Gary L.; Seeley, Ronald D.; Shelton, Donald G.; and Stromberg, Gary D., 4,812,103, Cl. 414-723.000.

J & L Sorg Enterprises, Inc.: *See*—
Sorg, James F.; and Sorg, Leo L., 4,811,625, Cl. 74-572.000.

J. M. Huber Corporation: *See*—
Wason, Satish K., 4,812,299, Cl. 423-328.000.

J. M. Voith GmbH: *See*—
Kinzler, Gernot; and Layher, Gerhard, 4,812,209, Cl. 162-343.000.
Tra, Josef, 4,812,229, Cl. 209-397.000.

J V Industries, Inc.: *See*—
Eyerly, Jon V., 4,811,530, Cl. 52-6.000.

Ja-Pac, Inc: *See*—
Hambrick, Paul R.; Wagner, Martin; and Whitaker, Kerry W., 4,812,985, Cl. 364-478.000.

Jackson, David, III; and Havel, Dale A. Method and apparatus for counterbalancing rotating bodies. 4,813,064, Cl. 378-197.000.

Jacobs, Philip R.: *See*—
Mullin, John B.; Hamilton, John C.; Orrell, Elisabeth D.; Jacobs, Philip R.; and Shenai-Khatkhate, Deodattta V., 4,812,586, Cl. 556-129.000.

Jacobsen, Poul: *See*—
Honore, Tage; Drejer, Jorgen; Jacobsen, Poul; and Nielsen, Flemming E., 4,812,458, Cl. 514-249.000.

Jacobson, Allan J.; Ho, Teh C.; Chianelli, Russell R.; Steger, John J.; and Montagna, Angelo A., to Exxon Research & Engineering Company. Hydrotreating with catalysts comprising mixtures of an amorphous sulfide or trivalent chromium and microcrystallites of molybdenum sulfide or tungsten sulfide. 4,812,227, Cl. 208-215.000.

Jaeger, Raymond E.; and Aslami, Mohd, to Spectran Corporation. Composite capillary tube structure and method of forming. 4,812,344, Cl. 428-34.600.

Jager, Willem W.: *See*—
Sie, Swan T.; Drent, Eit; and Jager, Willem W., 4,812.433, Cl. 502-117.000.

Jahn, Dieter; Keil, Michael; Kolassa, Dieter; Schirmer, Ulrich; Wuerzer, Bruno; Meyer, Norbert; Jung, Johann; and Rademacher, Wilhelm, to BASF Aktiengesellschaft. Cyclohexenone derivatives, preparation and use thereof as herbicides. 4,812,160, Cl. 71-88.000.

James, Keith; and Pring, Graham M., to British Petroleum Company p.l.c., The. Method of encapsulating organic material. 4,812,242, Cl. 210-735.000.

Jamison, Warren E., to Durafilm Corporation. Transit rail lubricant applicator. 4,811,818, Cl. 184-3.200.

Jang, Jaw J. Steering wheel release locking mechanism. 4,811,580, Cl. 70-218.000.

Janiszewski, Grzegorz, to AB Volvo. Motor vehicle gearbox with one-way clutch in a selected gear. 4,811,635, Cl. 74-331.000.
Janssen, Petrus C. M.: *See*—
v.d. Nieuwelaar, Josephus A.; and Janssen, Petrus C. M., 4,811,458, Cl. 17-11.10R.
Jantzen, Steven L. Mold assembly for pre-stressed concrete railroad ties. 4,812,113, Cl. 425-111.000.
Janus, Jonny. Pneumatic tire having multi-part annular bead core. 4,811,772, Cl. 152-540.000.
Januszewski, Joseph. Eye shield and headband combination. 4,811,430, Cl. 2-452.000.
Japan Synthetic Rubber Co., Ltd.: *See*—
Oshima, Noboru; Chikatsu, Yoshishige; Fukuhori, Toshiaki; Hamada, Tatsuro; and Fujimaki, Tatsuo, 4,812,525, Cl. 525-232.000.
Jayakumar, Raghavan, to General Electric Company. Compensation coil for temporal drift of a superconducting magnet. 4,812,797, Cl. 335-299.000.
Jaycox, Donald F.: *See*—
Kupferschmidt, Albert; Greene, Trace D.; and Jaycox, Donald F., 4,812,942, Cl. 361-119.000.
Jeans, Yvonne: *See*—
Kalpakci, Bayram; and Jeans, Yvonne, 4,811,788, Cl. 166-246.000.
Jeansson, Stig: *See*—
Vahlne, Anders; Svennerholm, Bo; Rymo, Lars; Jeansson, Stig; and Horal, Peter, 4,812,556, Cl. 530-324.000.
Jelalian, Albert V.: *See*—
Freedman, Nathan; Keene, Wayne H.; and Jelalian, Albert V., 4,812,035, Cl. 356-5.000.
Jeng, Horng-tsair. Numbering guessing game structure. 4,811,953, Cl. 273-265.000.
Jenne, Richard L.: *See*—
Cobb, Carleton M., III; Hirsbrunner, Hans G.; Gonsalves, Edward M.; Jenne, Richard L.; and Nott, Sepideh H., 4,812,799, Cl. 337-70.000.
Jennings, Alfred R., Jr.; and Shu, Paul, to Mobil Oil Corporation. Minimizing formation damage under adverse conditions during gravel pack operations. 4,811,789, Cl. 166-276.000.
Jennings, Alfred R., Jr.; and Stowe, Lawrence R., to Mobil Oil Corporation. Well bore device and method for sand control. 4,811,790, Cl. 166-278.000.
Jennings, William B.; Thompson, John; and Hayes, Richmond S., Jr., to Carrier Corporation. Sleeve assembly with attached duct and drain connections for a through the wall air conditioning unit. 4,811,570, Cl. 62-263.000.
Jensen, Harold A. Hygenic plastic footwear insert. 4,811,499, Cl. 36-10.000.
Jensen, Kurt: *See*—
Johnson, Oliver F., 4,813,030, Cl. 368-93.000.
Jensen, Stanley; and Williams, Norman, to Pioneer Hi-Bred International, Inc. Inbred corn like PHK29. 4,812,600, Cl. 800-1.000.
Jentzsch, Arndt: *See*—
Hefftler, Victor; Johne, Hans; Schulz, Horst; Jentzsch, Arndt; and Schone, Helmut, 4,811,663, Cl. 101-183.000.
Jeon, Jin S., to Gold Star Co., Ltd. Automatic tracking device for VCR with capstan motor controlled by color signal. 4,812,926, Cl. 360-70.000.
Jerila, Torsti T. T.: *See*—
Gephart, John D.; and Jerila, Torsti T. T., 4,811,683, Cl. 16-97.000.
Jervis B. Webb Company: *See*—
Smith, Harry E.; and Riedner, William E., 4,812,102, Cl. 414-280.000.
Jessup, Peter J., to Union Oil Company of California. Liquid fuels of high octane values. 4,812,146, Cl. 44-77.000.
Jewell, Ricky S. Deck bracket and method of attaching a deck to a building. 4,811,542, Cl. 52-741.000.
Jezequel, Roland: *See*—
Rouille, Philippe; and Jezequel, Roland, 4,812,000, Cl. 350-6.600.
Jidosha Kiki Co., Ltd.: *See*—
Kobayashi, Michio; and Senoh, Kazunori, 4,811,653, Cl. 92-98.00D.
JMC Black, Inc.: *See*—
Shane, Barry, 4,811,851, Cl. 211-41.000.
Jodac, Inc.: *See*—
Morton, John C., Jr., 4,811,475, Cl. 29-521.000.
Johannaber, Friedrich: *See*—
Fahner, Karsten; Johannaber, Friedrich; Depcik, Hans-Werner; Kaminski, Axel; and Van Hooren, Rudiger, 4,812,247, Cl. 252-511.000.
John Cotton Limited: *See*—
McConnell, Anthony; and Bedford, Anthony M., 4,812,186, Cl. 156-90.000.
John F. Masoncup: *See*—
Masoncup, John F.; and Mayer, Thomas J., 4,811,578, Cl. 70-38.00B.
John, Reinmar: *See*—
Meyer, Rainer-Leo; John, Reinmar; Nagel, Rolf; and Muller, Gunter, 4,812,356, Cl. 428-220.000.
John Wyeth & Brother Ltd.: *See*—
Shepherd, Robin G.; Chai, Sie-Yearl; Lichty, Maynard E.; and Milowsky, Arnold S., 4,812,574, Cl. 548-151.000.
Johne, Hans: *See*—
Hefftler, Victor; Johne, Hans; Schulz, Horst; Jentzsch, Arndt; and Schone, Helmut, 4,811,663, Cl. 101-183.000.
Johnson Electrical Industrial Manufactory, Limited: *See*—
Baines, Roger F., 4,812,693, Cl. 310-71.000.
Johnson, Harry; and Ware, Ralph M., to Casper Colosimo & Son, Inc. Embedding cablelike members. 4,812,079, Cl. 405-164.000.
Johnson, Jerry L.: *See*—
Ethridge, Edwin C.; and Johnson, Jerry L., 4,811,873, Cl. 223-32.000.
Johnson, Oliver F., to Jensen, Kurt. Resettable multiple timer. 4,813,030, Cl. 368-93.000.
Johnson, Richard L.; Cherry, John A.; and Pankow, James F. Borehole sampling. 4,811,599, Cl. 73-155.000.
Johnson, Roy L.: *See*—
Belanger, Thomas D., Jr.; and Johnson, Roy L., 4,812,947, Cl. 361-220.000.
Jonczyk, Alfred: *See*—
Raddatz, Peter; Holzemann, Gunter; Jonczyk, Alfred; Schmitges, Claus J.; and Minck, Klaus O., 4,812,555, Cl. 530-323.000.
Jones-Blair Company: *See*—
Wyman, Larry D.; and Webb, Joseph D., 4,813,000, Cl. 364-526.000.
Jones, Gregory D.; Owens, William R.; Thiel, Clifford G.; and Danby, Clive M., to Sundstrand Corp. Current fault protection system. 4,812,943, Cl. 361-92.000.
Jones, Peter J., to Lord Corporation. Volume compensated fluid mount. 4,811,919, Cl. 244-54.000.
Jordan, William. Ice fishing rig. 4,811,514, Cl. 43-19.200.
Joslyn, Larry, to Joslyn Valve Corporation. Chemical sterilant recovery and conversion. 4,812,292, Cl. 422-31.000.
Joslyn Valve Corporation: *See*—
Joslyn, Larry, 4,812,292, Cl. 422-31.000.
Jostan, Josef L.: *See*—
Bogenschutz, August F.; Jostan, Josef L.; and Ostwald, Robert, 4,812,202, Cl. 156-628.000.
Joyce, Thomas F.; Nusinov, Eugene; and Brown, Richard P., to Honeywell Bull Inc. High speed high density dynamic address translator. 4,813,002, Cl. 365-49.000.
Jud, Wilfried, to Folienwalzwerk Brueder Teich Aktiengesellschaft. Package with a gas-tight package envelope. 4,811,848, Cl. 206-610.000.
Juliano, Rudolph L.: *See*—
Lopez-Berestein, Gabriel; Mehta, Reeta; Hopfer, Roy L.; and Juliano, Rudolph L., 4,812,312, Cl. 424-417.000.
Jung, Johann: *See*—
Jahn, Dieter; Keil, Michael; Kolassa, Dieter; Schirmer, Ulrich; Wuerzer, Bruno; Meyer, Norbert; Jung, Johann; and Rademacher, Wilhelm, 4,812,160, Cl. 71-88.000.
Jung, Richard H.; and Logadon, Philip R., to Motorola, Inc. Tab-type semiconductor process. 4,812,421, Cl. 437-211.000.
Jungkman, David L.; Howard, James W.; and White, Timothy E., to Honeywell Inc. Prism cold shield. 4,812,655, Cl. 250-352.000.
Juras, Karl-Heinz, to Schott Glaswerke. Device and process for heating a flat object made of thermoplastic material along a predetermined zone. 4,812,152, Cl. 65-120.000.
K Electronics, Inc.: *See*—
Kennedy, Richard E.; and Fredrich, Earl R., 4,812,825, Cl. 340-601.000.
K-Tron International, Inc.: *See*—
Bullivant, Kenneth W., 4,811,835, Cl. 198-762.000.
Kaanta, Henry W.: *See*—
Sanders, Robert E., Jr.; Kaanta, Henry W.; McBride, John K.; Milner, Milton W.; Perigo, Terry A.; and Shelby, Samuel L., 4,812,183, Cl. 148-439.000.
Kabellmetal Electro GmbH: *See*—
Ziemek, Gerhard; Staschewski, Harry; and Gunia, Ewald, 4,811,888, Cl. 228-148.000.
Kabeya, Motoo: *See*—
Shindou, Yoshio; and Kabeya, Motoo, 4,812,371, Cl. 428-659.000.
Kabushi Kaisha Komatsu Seisa Kusho: *See*—
Itow, Koichiro, 4,811,712, Cl. 123-399.000.
Kabushiki Kaisha Aoyama: *See*—
Masui, Kosuke, 4,812,338, Cl. 428-4.000.
Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo: *See*—
Mitsuhashi, Masakazu; Sakai, Shuzo; and Miyake, Toshio, 4,812,444, Cl. 514-53.000.
Kabushiki Kaisha Hoky (aka Hoky Corp.): *See*—
Kobayashi, Kiyoshi, 4,811,449, Cl. 15-231.000.
Kabushiki Kaisha Honma Gorufu Kurabu Seisakusho: *See*—
Honma, Yukihiro, 4,812,187, Cl. 156-245.000.
Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Izumi, Asashiro, 4,812,701, Cl. 312-285.000.
Kabushiki Kaisha Kaneda Kikai Seisakusho: *See*—
Fuke, Masanobu; Watanabe, Takemi; and Shiba, Noriyuki, 4,812,198, Cl. 156-497.000.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Matsushima, Tadashi, 4,811,644, Cl. 84-1.200.
Kabushiki Kaisha Kenwood: *See*—
Ichijyo, Hiroshi, 4,812,717, Cl. 315-367.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Kubo, Kazuo; Tsuboi, Noboru; Nishitani, Kunihiko; and Nomura, Ituro, 4,812,110, Cl. 418-1.000.
Kabushiki Kaisha Kosmek: *See*—
Yonezawa, Keitaro, 4,812,109, Cl. 417-401.000.
Kabushiki Kaisha Nisshin Seisakusho: *See*—
Nakae, Yoshio; Kinoshita, Akiyo; and Tanaka, Koichi, 4,811,521, Cl. 51-5.00D.
Kabushiki Kaisha Sugino Machine: *See*—
Nagata, Yukiaki, 4,811,902, Cl. 239-240.000.

Kabushiki Kaisha Tokoyo Kikai Seisakusho: *See*—
Fuke, Masanobu; Watanabe, Takemi; and Shiba, Noriyuki, 4,812,198, Cl. 156-497.000.
Kabushiki Kaisha Tokyo Keiki: *See*—
Masuzawa, Isao; Miyayama, Toshio; Nakayama, Mitsuo; and Nishimura, Koichi, 4,811,679, Cl. 114-144.0RE.
Kabushiki Kaisha Toshiba: *See*—
Fujioka, Arisa; and Kageyama, Satoshi, 4,813,004, Cl. 364-567.000.
Kakegawa, Makoto, 4,813,061, Cl. 378-99.000.
Kakumu, Masakazu, 4,812,889, Cl. 357-42.000.
Kinoshita, Kiyoshi, 4,812,973, Cl. 364-200.000.
Masaki, Hideo, 4,812,059, Cl. 400-56.000.
Matsui, Masataka; Iizuka, Tetsuya; Tsujimoto, Jun-ichi; Ohtani, Takayuki; and Isobe, Mitsuo, 4,813,022, Cl. 365-203.000.
Minekane, Tomiharu, 4,812,657, Cl. 250-372.000.
Morishita, Mimpei; and Azukizawa, Teruo, 4,811,667, Cl. 104-284.000.
Okamoto, Toshio; Doi, Miwako; and Iwai, Isamu, 4,813,010, Cl. 364-900.000.
Sawada, Kazuhiro; and Sakurai, Takayasu, 4,812,735, Cl. 323-313.000.
Shigehara, Hiroshi; Shiraishi, Mikio; Watanabe, Yasuhiro; and Sugi, Nobuo, 4,813,008, Cl. 364-760.000.
Takagi, Syoji; and Saito, Hiroyoshi, 4,812,966, Cl. 364-200.000.
Yamakawa, Tsutomu; and Iwao, Hirofumi, 4,812,656, Cl. 250-363.00R.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Nishibe, Yuji; Nonomura, Yutaka; and Takeuchi, Masaharu, 4,811,609, Cl. 73-862.360.
Kabushiki Kaisya Advance Kaihatsu Kenkyujo: *See*—
Kawai, Yasuo; and Yazawa, Kazunaga, 4,812,441, Cl. 514-2.000.
Kaczmarski, Wally L.: *See*—
Watts, Verne C.; Loraas, Orlan J.; Kaczmarski, Wally L.; and Asche, James E., 4,811,983, Cl. 296-190.000.
Kadowaki, Hidejiro; Hosaka, Akihito; and Matsumoto, Kenichi, to Canon Kabushiki Kaisha. Original reading apparatus with light source switching without a switching circuit. 4,812,900, Cl. 358-75.000.
Kagabu, Shinzo: *See*—
Shiokawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; Moriya, Koichi; and Bassner, Bernd, 4,812,454, Cl. 514-256.000.
Shiokawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; and Moriya, Koichi, 4,812,571, Cl. 546-296.000.
Kagawa, Keiichi; and Taniyasu, Kiyoshi, to Mitsui Mining & Smelting Co., Ltd. Anode active material and alkaline cells containing same, and method for the production thereof. 4,812,374, Cl. 429-50.000.
Kageno, Kenji; Ueda, Toshio; and Harada, Susumu, to Nitto Boseki Co., Ltd. Preparation of polymers of monoallylamine and diallylamine derivatives with azo catalyst. 4,812,540, Cl. 526-218.100.
Kageyama, Masao: *See*—
Kondo, Hitoshi; and Kageyama, Masao, 4,812,398, Cl. 435-14.000.
Kageyama, Satoshi: *See*—
Fujioka, Arisa; and Kageyama, Satoshi, 4,813,004, Cl. 364-567.000.
Kai, Hajime; and Ochi, Kiyofumi, to Tokyo Shibayra Denki Kabushiki Kaisha. Semiconductor memory device with delayed precharge signals. 4,813,021, Cl. 365-194.000.
Kai, Seiichi: *See*—
Kondo, Michitada; Minai, Masayoshi; Kai, Seiichi; Higashii, Takayuki; and Ueda, Yuji, 4,812,585, Cl. 549-483.000.
Kaieda, Shozo, to Kentex Information Systems, Inc. Cleaning apparatus for electrophotography. 4,812,878, Cl. 355-15.000.
Kaimo, Matti O., to Oy Lohja Ab. Device for joining together building units. 4,812,098, Cl. 411-360.000.
Kakegawa, Makoto, to Kabushiki Kaisha Toshiba. X-ray diagnosis method and apparatus. 4,813,061, Cl. 378-99.000.
Kakinuma, Koichiro; Ando, Makoto; Sawa, Masahiko; Ohmuro, Hideaki; Ohryo, Akira; and Nakamura, Tadahiko, to Sony Corporation. Portable magnetic card reading and writing apparatus with verification of constant and user supplied data. 4,812,632, Cl. 235-479.000.
Kakumu, Masakazu, to Kabushiki Kaisha Toshiba. Semiconductor device FET with reduced energy level degeneration. 4,812,889, Cl. 357-42.000.
Kakuta, Yonehiro; Takigawa, Kouichi; Noji, Akio; Kuwabara, Shigeaki; Shimada, Tadashi; and Iida, Michihiro, to Honda Giken Kogyo Kabushiki Kaisha. Cant angle sensor assembly. 4,811,492, Cl. 33-366.000.
Kallies, Guenter; and Scheidemann, Dieter, to Messerschmitt-Boelkow-Blohm GmbH. Fiber reinforced shell structure of synthetic material. 4,811,540, Cl. 52-630.000.
Kallstrom, Walter H. Windshear detection indicator system. 4,812,844, Cl. 340-949.000.
Kalpakci, Bayram; and Jeans, Yvonne, to Standard Oil Company, The. Surfactant combinations and enhanced oil recovery method employing same. 4,811,788, Cl. 166-246.000.
Kalversberg, Manfred: *See*—
Honig, Ernst-August; Kaspar, Lothar; Kalversberg, Manfred; Oberpichler, Gerd; Hagemann, Gottfried; and Schmidt, Dieter, 4,811,631, Cl. 74-762.000.
Kam Kwong Lee Limited: *See*—
Hiramatsu, Keiji, 4,812,631, Cl. 235-467.000.
Kamakura, Takuro: *See*—
Suzuki, Tameyuki; Yasukawa, Junichi; Nomura, Toyokazu; Toda, Kazuo; Kamakura, Takuro; and Ota, Toshiaki, 4,812,387, Cl. 430-311.000.
Kamata, Shigeru: *See*—
Iizuka, Toshimi; and Kamata, Shigeru, 4,812,015, Cl. 350-252.000.
Kamiguchi, Masao; and Umemoto, Hiroshi, to Fanuc Ltd. Suckback method and apparatus in an injection molding machine. 4,812,268, Cl. 264-40.100.
Kamilos, G. N.; Kennedy, D. D.; and Lederhos, L. J., Jr., to Chevron Research Company. Downhole gaseous liquid flow agitator. 4,811,786, Cl. 166-303.000.
Kaminski, Axel: *See*—
Fahner, Karsten; Johannaber, Friedrich; Depcik, Hans-Werner; Kaminski, Axel; and Van Hooren, Rudiger, 4,812,247, Cl. 252-511.000.
Kamiya, Takeshi: *See*—
Yokoyama, Shigeki; Kamiya, Takeshi; Niikawa, Takeo; Nagase, Masakatsu; and Kuroishi, Tetujiro, 4,812,355, Cl. 428-215.000.
Kanahara, Naoyuki; Furo, Masahiro; and Furihata, Tetsuo, to Dowa Mining Co., Ltd. Method for bonding copper plate to alumina substrate and process for producing copper/alumina bonded assembly. 4,811,893, Cl. 228-198.000.
Kanamori, Hiroo: *See*—
Kyoto, Michihisa; Yoshioka, Naoki; Tanaka, Gotaro; Kanamori, Hiroo; Watanabe, Minoru; and Nakahara, Motohiro, 4,812,155, Cl. 65-3.120.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Takahashi, Satomi; Yamada, Yukio; Ueda, Yasuyoshi; Katayama, Yasuhiro; Shimada, Yoshio; and Watanabe, Kiyoshi, 4,812,406, Cl. 435-280.000.
Kanekatsu, Kensuke: *See*—
Natori, Tatsuo; Hioki, Susumu; Shimaguchi, Takashi; Yamada, Toshihiro; Watanabe, Akihide; and Kanekatsu, Kensuke, 4,812,278, Cl. 264-221.000.
Kaneko, Mika: *See*—
Nemoto, Tsuneo; and Kaneko, Mika, 4,812,937, Cl. 360-133.000.
Kaneko, Yasuhiro: *See*—
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Kansai Electric Power Co., Inc.: *See*—
Nakagawa, Hiroto; Oono, Yasuteru; Kato, Tadaatsu; Nagura, Osamu; Niwa, Sadahiko; Furukawa, Yosio; and Kayukawa, Shigehiro, 4,812,730, Cl. 318-732.000.
Kansai Paint Co., Ltd.: *See*—
Maki, Tetsu, 4,812,537, Cl. 525-488.000.
Sugimura, You; Numa, Nobushige; Watanabe, Tadashi; Sugiyama, Yutaka; Ohira, Kazuhiko; and Yamaguchi, Sachio, 4,812,337, Cl. 427-407.100.
Kanzaki Paper Mfg. Co., Ltd.: *See*—
Yamori, Tsunefumi; Shuku, Shigekazu; and Fujioka, Hironari, 4,812,438, Cl. 503-200.000.
Kao Corporation: *See*—
Hosokawa, Yasunori; and Kobayashi, Takatoshi, 4,812,486, Cl. 521-139.000.
Iwasaki, Tetsuji; and Hosokawa, Hitoshi, 4,812,158, Cl. 71-64.120.
Wakatsuki, Junya; Sano, Tomohiko; and Kurosaki, Tomihiro, 4,812,254, Cl. 252-135.000.
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Liu, Christopher S.; Benfaremo, Nicholas; Kapuscinski, Maria M.; and Grina, Larry D., 4,812,261, Cl. 252-51.50A.
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Ikeda, Hiroshi; Umemura, Shinichiro; and Katakura, Kageyoshi, 4,811,740, Cl. 128-660.010.

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Takahashi, Satomi; Yamada, Yukio; Ueda, Yasuyoshi; Katayama, Yasuhiro; Shimada, Yoshio; and Watanabe, Kiyoshi, 4,812,406, Cl. 435-280.000.

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Endo, Kazuyuki; Taniguchi, Motoaki; Yamada, Shigeki; Takahashi, Masanobu; and Kato, Kenshiro, 4,811,773, Cl. 152-543.000.

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Katsuta, Atsushi: *See*—
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Kaufman, Jack W.: *See*—
Brown, James B.; and Kaufman, Jack W., 4,812,067, Cl. 401-132.000.

Kaufman, William M.; and Guzman, Alberto, to Carnegie-Mellon University. Thermal sensor for detection of railroad bearing failures. 4,812,826, Cl. 340-682.000.

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Kawabe, Takeshi: *See*—
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Yamamoto, Taizo; Konishi, Hirokazu; Kawaguchi, Yoshihisa; and Ohnishi, Yoshizumi, 4,811,802, Cl. 177-1.000.

Kawai, Yasuo; and Yazawa, Kazunaga, to Kabushiki Kaisya Advance Kaihatsu Kenkyujo. Hypocholesterolemically active protein derived from streptococcus. 4,812,441, Cl. 514-2.000.

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Suzuki, Masami; Nishida, Hiroshi; Suzuki, Tomio; Kawamura, Katsumi; and Takahashi, Tsuyoshi, 4,812,934, Cl. 360-106.000.

Kawamura, Masaharu, to Canon Kabushiki Kaisha. Auto-bracket device for camera. 4,812,870, Cl. 354-412.000.

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Taneya, Mototaka; Matsumoto, Mitsuhiro; Kawanishi, Hidenori; and Matsui, Sadayoshi, 4,813,051, Cl. 372-150.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Ono, Hiromi; and Shirai, Tetsuaki, 4,811,705, Cl. 123-195.0AC.

Kawashima, Hiromi; and Takeuchi, Atsushi, to Fujitsu Limited. High voltage detecting circuit. 4,812,680, Cl. 307-350.000.

Kawata, Kyozo: *See*—
Hamashima, Yoshio; Minami, Kyoji; Kawata, Kyozo; Sakamoto, Teruo; Takeda, Toyohiko; Suzuki, Yusuke; and Tujikawa, Masanori, 4,812,561, Cl. 540-222.000.

Kawato, Yutaka: *See*—
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Kawauchi, Yoshikazu: *See*—
Miyama, Hiroshi; Kawauchi, Yoshikazu; Tomii, Kaoru; and Nishida, Jun, 4,812,716, Cl. 315-366.000.

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Nakagawa, Hiroto; Oono, Yasuteru; Kato, Tadaatsu; Nagura, Osamu; Niwa, Sadahiko; Furukawa, Yosio; and Kayukawa, Shigehiro, 4,812,730, Cl. 318-732.000.

Kazami, Kazuyuki: *See*—
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KB Alloys, Inc.: *See*—
Sigworth, Geoffrey K., 4,812,290, Cl. 420-552.000.

Keeffe, William M.; Waymouth, John F.; and Zaslavsky, Gregory, to GTE Products Corporation. Arc discharge lamp with electrodeless ultraviolet radiation starting source. 4,812,714, Cl. 315-60.000.

Keel, Jerry L.; Hines, Thomas M.; Davis, Glen; and Parks, William E., to Avex Electronics Inc. Environmental stress screening apparatus. 4,812,750, Cl. 324-158.00F.

Keely, Stanley L.: *See*—
Crawford, Thomas C.; Keely, Stanley L.; Larson, David L.; Lombardino, Joseph G.; and Maciejko, James J., 4,812,455, Cl. 514-226.500.

Keene, Wayne H.: *See*—
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Keil, Michael: *See*—
Jahn, Dieter; Keil, Michael; Kolassa, Dieter; Schirmer, Ulrich; Wuerzer, Bruno; Meyer, Norbert; Jung, Johann; and Rademacher, Wilhelm, 4,812,160, Cl. 71-88.000.

Keith, Malcolm E., to Midaco Corporation. Printing platform. 4,811,939, Cl. 271-146.000.

Keller, Paul M.: *See*—
Ellis, Ronald W.; Keller, Paul M.; Lowe, Robert S.; and Davison, Andrew J., 4,812,559, Cl. 536-27.000.

Kelley, Donald R.: *See*—
Kennon, James A.; Islam, Shafidul; Popken, Jeffrey L.; Medders, Jerry B.; Fitzgerald, Susan S.; Kelley, Donald R.; and Burr, Philip A., 4,812,114, Cl. 425-116.000.

Kelley, James L.: *See*—
Volpe, James R.; and Kelley, James L., 4,811,987, Cl. 297-440.000.

Kelley, John D., Jr.: *See*—
Shoemaker, Paul S.; and Kelley, John D., Jr., 4,811,771, Cl. 152-454.000.

Kelly, Thomas J. Apparel holder. 4,811,852, Cl. 211-119.000.

Kelly, William W.: *See*—
Djordjevic, Ilija; Kelly, William W.; and Vanderpoel, Richard E., 4,811,715, Cl. 123-447.000.

Kemira OY: *See*—
Niemi, Jouko; Pyoria, Kaarlo; and Korhonen, Heikki, 4,811,907, Cl. 241-5.000.

Kemp, Daniel N., to Dow Corning Corporation. Fixed-volume trapped rubber molding apparatus. 4,812,115, Cl. 425-405.200.

Kennedy, D. D.: *See*—
Kamilos, G. N.; Kennedy, D. D.; and Lederhos, L. J., Jr., 4,811,786, Cl. 166-303.000.

Kennedy, Richard E.; and Fredrich, Earl R., to K Electronics, Inc. Tornado warning system. 4,812,825, Cl. 340-601.000.

Kenney, Lawrence P.: *See*—
Cornell, Lorne T.; Sisto, Eugene; Ohtola, Victoria L.; and Kenney, Lawrence P., 4,811,839, Cl. 206-303.000.

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Nash, John; and Michels, Mark, 4,811,735, Cl. 128-305.000.

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Kaieda, Shozo, 4,812,878, Cl. 355-15.000.

Kerherve, Jean-Pierre; and Queromes, Armel. Method for forming a coated substrate. 4,812,332, Cl. 427-168.000.

Kern, Jeffrey A., to General Electric Company. Temperature sensor assembly for an automatic surface unit. 4,812,624, Cl. 219-450.000.

Kern, Walter P., to Teradyne, Inc. Probe for testing electronic components. 4,812,745, Cl. 324-158.00P.

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Fremery, Johan K., 4,812,694, Cl. 310-90.500.

Kerr-McGee Chemical Corporation: *See*—
Laughlin, William C.; and Schulke, Dwight A., 4,812,302, Cl. 423-605.000.

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Sue, Horace O.; Guttman, Richard T.; Pendley, David M.; and Keys, William C., 4,812,674, Cl. 307-116.000.

Kiekhaefer, John H.; Perko, Jack E.; Hetzer, Joseph S.; and Harris, Frank W., to W. H. Brady Co. Pultruded fiber reinforced plastic marking devices. 4,812,343, Cl. 428-35.600.

Kiely, John S.: *See*—
Blankley, C. John; Hodges, John C.; Kiely, John S.; and Klutchko, Sylvester R., 4,812,462, Cl. 514-303.000.

Kikuchi, Juro, to Olympus Optical Co., Ltd. Zoom finder. 4,812,023, Cl. 350-427.000.

Kimstock, Inc.: *See*—
Satterfield, Donald D., 4,811,434, Cl. 4-543.000.

Kimura, Akiyoshi: *See*—
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Kimura, Nobuo, to Mazda Motor Corporation. Method of and apparatus for adjusting the weight of a workpiece. 4,812,090, Cl. 409-132.000.

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King, Clive G.; Padilla, John A.; and Sproulle, Richard J., to Welding Institute, The. Friction welding. 4,811,887, Cl. 228-2.000.
Kinghorn, Mark D., Jr. Seal for floating roof. 4,811,859, Cl. 220-224.000.
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Yamazaki, Shunpei; Suzuki, Kunio; Kinka, Mikio; Fukada, Takeshi; Abe, Masayoshi; Kobayashi, Ippei; Shibata, Katsuhiko; Susukida, Masato; Nagayama, Susumu; and Koyanagi, Kaoru, 4,812,415, Cl. 437-2.000.
Kinoshita, Akiyo: *See*—
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Kinoshita, Kiyoshi, to Kabushiki Kaisha Toshiba. Multiprocessor system and control method therefor. 4,812,973, Cl. 364-200.000.
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Kirkendall, Vern S. Insulated beverage box carrier. 4,812,054, Cl. 383-110.000.
Kirker, Garry W.; and Varghese, Philip, to Mobil Oil Corporation. Production of lubricasting oils by hydrocracking. 4,812,222, Cl. 208-89.000.
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Kithany, Subhash S., to Owens-Corning Fiberglas Corporation. Refractory metal substrate and coatings therefor. 4,812,372, Cl. 428-664.000.
Kittel, Friedrich; and Kolb, Dieter, to Fichtel & Sachs AG. Friction clutch with interlocking flywheel and clutch cover. 4,811,826, Cl. 192-70.130.
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Klein, James D., to Atlantic Richfield Company. Telluric noise cancellation in induced polarization prospecting. 4,812,766, Cl. 324-362.000.
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Klier, Benno: *See*—
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Klinkowstein, Robert E.; and Shefer, Ruth, to Science Research Laboratory, Inc. Electrostatic ion accelerator. 4,812,775, Cl. 328-233.000.
Kloker, Werner: *See*—
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Kloti, Karl: *See*—
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Knepper, Paul A. Method for the prevention of ocular hypertension, treatment of giaucoma and treatment of ocular hypertension. 4,812,448, Cl. 514-178.000.
Knop, Hans-Georg; and Schulz-Hennig, Jorg, to Dr. Ing. Rudolf Hell GmbH. Diaphragm arrangement for opto-electronic scanning of originals. 4,812,913, Cl. 358-285.000.
Knudson, Gary A. Apparatus for making panels. 4,811,587, Cl. 72-181.000.
Koba, Keiichiro; Utsunomiya, Taizo; Saitow, Yoshiaki; Iwanaga, Katsusuke; Matsue, Michihiko; and Nishitani, Noriaki, to Mitsui Mining Company, Limited. Continuous process for producing long α-alumina fibers. 4,812,271, Cl. 264-63.000.
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Kobayashi, Masaaki: *See*—
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Kobayashi, Masashi, to Maruman Golf Co., Ltd. Construction of a club-head for a golf club. 4,811,949, Cl. 273-171.000.
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Kobayashi, Yasuhito: *See*—
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Koehler, Elmer: *See*—
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KOEI Chemical Co., Ltd.: *See*—
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Kohsiek, Cord H., to U.S. Philips Corp. Current-mirror arrangement. 4,812,734, Cl. 323-312.000.
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Kohut, William, to H. C. Spinks Clay Company Inc. Clay slurry. 4,812,427, Cl. 501-148.000.
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Koike, Michiro: *See*—
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Antoku, Fujio; Yoshigi, Mayumi; Saji, Ikutaro; Kojima, Atsuyuki; and Ishizumi, Kukuo, 4,812,461,-Cl. 514-278.000.
Kojima, Hideo: *See*—
Shirakura, Osamu; Kojima, Hideo; Ouchi, Kiyohisa; and Ishimaru, Sueaki, 4,812,480, Cl. 514-557.000.
Kolakowski, Manfred: *See*—
Streubel, Hans; Golla, Rainer; and Kolakowski, Manfred, 4,811,779, Cl. 164-418.000.
Kolassa, Dieter: *See*—
Jahn, Dieter; Keil, Michael; Kolassa, Dieter; Schirmer, Ulrich; Wuerzer, Bruno; Meyer, Norbert; Jung, Johann; and Rademacher, Wilhelm, 4,812,160, Cl. 71-88.000.
Kolb, Dieter: *See*—
Kittel, Friedrich; and Kolb, Dieter, 4,811,826, Cl. 192-70.130.
Kolbenschmidt Aktiengesellschaft: *See*—
Bickle, Wolfgang, 4,812,367, Cl. 428-332.000.
Koleske, Joseph V.; and Kwiatkowski, George T., to Union Carbide Corporation. Photocopolymerizable compositions based on hydroxyl-containing organic materials and substituted cycloaliphatic monoepoxide reactive diluents. 4,812,488, Cl. 522-31.000.
Kolvites, Albert; and Brancher, Rodney E., to Intermetro Industries Corporation. Shelf support system having a triangular support post. 4,811,670, Cl. 108-107.000.

Komiya, Yutaka, to Canon Kabushiki Kaisha. Image reproducing equipment. 4,812,910, Cl. 358-282.000.
Kondo, Hiroki; Saito, Hiroaki; Katsumata, Makoto; and Kinoshita, Michitaka, to Yazaki Corporation. Connector terminal. 4,812,138, Cl. 439-865.000.
Kondo, Hitoshi; and Kageyama, Masao, to Unitika Ltd. Reagent for measuring amylase activity and measuring method thereof. 4,812,398, Cl. 435-14.000.
Kondo, Jiro: *See*—
Saiki, Goro; Kondo, Jiro; Takeda, Koichi; Maki, Mutsuo; and Ooki, Tutomu, 4,812,166, Cl. 75-0.50C.
Kondo, Masahiro: *See*—
Nakagawa, Hiroaki; Kondo, Masahiro; and Ohishi, Noriake, 4,812,279, Cl. 264-311.000.
Kondo, Michitada; Minai, Masayoshi; Kai, Seiichi; Higashii, Takayuki; and Ueda, Yuji, to Sumitomo Chemical Company, Limited. Process for producing 2-acetylfuran derivatives. 4,812,585, Cl. 549-483.000.
Kondo, Shunichi: *See*—
Katumata, Shoji; and Kondo, Shunichi, 4,811,720, Cl. 123-527.000.
Kone Oy: *See*—
Rossi, Hannu, 4,811,820, Cl. 188-71.600.
Konig, Herbert; and Stahle, Gerhard, to Zinser Textilmaschinen GmbH. Method and means for controlling the drafting of sliver in a draw frame. 4,812,993, Cl. 364-470.000.
Konishi, Hirokazu: *See*—
Yamamoto, Taizo; Konishi, Hirokazu; Kawaguchi, Yoshihisa; and Ohnishi, Yoshizumi, 4,811,802, Cl. 177-1.000.
Konishiroku Photo Industry Co.: *See*—
Miyake, Toru; and Nakano, Yasushi, 4,812,358, Cl. 428-323.000.
Konken, Johann: *See*—
Schmitz, Heinz-Gunter; and Konken, Johann, 4,811,523, Cl. 51-131.100.
Konrath, Karl: *See*—
Braun, Wolfgang; Emsmann, Wulf; Konrath, Karl; Krieger, Klaus; and Nothdurft, Heinz, 4,811,709, Cl. 123-357.000.
Kopernicky, Jaroslav, to Stream Industrial Systems Inc. Particulate material loader. 4,812,086, Cl. 406-153.000.
Kordomenos, Panagiotis I.: *See*—
Dervan, Andrew H.; and Kordomenos, Panagiotis I., 4,812,535, Cl. 525-450.000.
Korhonen, Heikki: *See*—
Niemi, Jouko; Pyoria, Kaarlo; and Korhonen, Heikki, 4,811,907, Cl. 241-5.000.
Korhonen, Kaarlo: *See*—
Aalto, Erkki; Korhonen, Kaarlo; Pekkinen, Jorma; Sundberg, Esa; Tolmunen, Arvi; Vartiainen, Seppo; and Villikka, Reijo, 4,811,724, Cl. 126-299.00D.
Korniliev, Gennady A.: *See*—
Antipov, Georgy A.; Gelfand, Mikhail L.; Goldshtein, Boris G.; Korniliev, Gennady A.; Lavnikov, Nikolai S.; Tsipenjuk, Yakov I.; and Yakubovsky, Petr S., 4,811,797, Cl. 173-93.600.
Kosnosky, Theodore P.: *See*—
Rice, Ronald B.; Lobo, Edward M.; Casanova, Hector A.; and Kosnosky, Theodore P., 4,812,941, Cl. 361-15.000.
Kosuge, Tokuo: *See*—
Ishikawa, Tooru; and Kosuge, Tokuo, 4,811,905, Cl. 239-585.000.
Kotera, Masayuki, to Seikow Chemical Engineering & Machinery Ltd. Magnet pump. 4,812,108, Cl. 417-368.000.
Kouri, Richard E.: *See*—
Hurd, Stanley M.; and Kouri, Richard E., 4,812,216, Cl. 204-182.800.
Koyama, Osamu, to Canon Kabushiki Kaisha. Magneto-optical information reproducing apparatus in which the azimuth angle of the transmission axis of an analyzer is optimized so that the C/N ratio of a reproducing signal is maximum. 4,813,032, Cl. 369-13.000.
Koyama, Takeshi: *See*—
Akashi, Akira; Ishizaki, Akira; Suda, Yasuo; Ohnuki, Ichiro; Ohtaka, Keiji; and Koyama, Takeshi, 4,812,869, Cl. 354-408.000.
Koyanagi, Kaoru: *See*—
Yamazaki, Shunpei; Suzuki, Kunio; Kinka, Mikio; Fukada, Takeshi; Abe, Masayoshi; Kobayashi, Ippei; Shibata, Katsuhiko; Susukida, Masato; Nagayama, Susumu; and Koyanagi, Kaoru, 4,812,415, Cl. 437-2.000.
Koyanagi, Katsubumi: *See*—
Yamawaki, Chiaki; Sasada, Taizo; Iwaki, Tetsuo; and Koyanagi, Katsubumi, 4,812,987, Cl. 364-724.010.
Kozoe, Katutoshi: *See*—
Yamamoto, Masahiro; Kumata, Mituyosi; Kozoe, Katutoshi; and Itoh, Tsutomu, 4,811,689, Cl. 118-624.000.
Kozuki, Susumu: *See*—
Nagashima, Yoshitake; Ishikawa, Hisashi; Kozuki, Susumu; Yoshimura, Katsuji; Takahashi, Koji; and Nagasawa, Kenichi, 4,812,920, Cl. 358-310.000.
Krasij, Bohdan, to Carlingswitch, Inc. Circuit breaker housing with centered actuator. 4,812,793, Cl. 335-8.000.
Krause, James N., to Seagate Technology, Inc. Stepper motor data recovery method using a magnetic hysteresis based stepping algorithm. 4,812,928, Cl. 360-78.080.
Krause, Joachim; Romer, Michael; Pohl, Ludwig; Scheuble, Bernhard; and Weber, Georg, to Merck Patent Gesellschaft Mit Beschrankter Haftung. Fluorine-containing pyrimidine derivatives. 4,812,258, Cl. 252-299.610.
Kraverath, Robert G. Universal tail piece for installation in a water waste line. 4,811,431, Cl. 4-191.000.
Kreher, Peter-Jurgen: *See*—
Kuhn, Siegfried; and Kreher, Peter-Jurgen, 4,812,057, Cl. 384-42.000.
Kress, Hans-Jurgen; Lindner, Christian; Grape, Wolfgang; Peters, Horst; Schoeps, Jochen; and Wittmann, Dieter, to Bayer Aktiengesellschaft. Ageing-resistant thermoplastic moulding materials of good impact strength. 4,812,515, Cl. 525-69.000.
Krieger, George A. Guide for hand manipulated powered cutting tools. 4,811,643, Cl. 83-745.000.
Krieger, Klaus: *See*—
Braun, Wolfgang; Emsmann, Wulf; Konrath, Karl; Krieger, Klaus; and Nothdurft, Heinz, 4,811,709, Cl. 123-357.000.
Krone AG: *See*—
Biederstedt, Lutz; Gerke, Dieter; and Sander, Claus, 4,812,004, Cl. 350-96.200.
Kruger, Peter; and Federmann, Dieter, to Rockwell-Golde G.m.b.H. Automobile roof having a lid associated with a roof opening. 4,811,985, Cl. 296-214.000.
Kubo, Kazuo; Tsuboi, Noboru; Nishitani, Kunihiko; and Nomura, Ituro, to Kabushiki Kaisha Kobe Seiko Sho. Oil-free screw compressor with bypass of cooled discharged gas. 4,812,110, Cl. 418-1.000.
Kuboki, Yoshinori; Fujimoto, Daisaburo; Aoki, Hideki; and Fujita, Keijiro, to Dental Kagaku Kabushiki Kaisha. Apatite immobilized glucanase. 4,812,404, Cl. 435-175.000.
Kubota, Atsushi; Sasaki, Nobukazu; Kasamura, Toshirou; Kusumoto, Toshihiko; Shiratori, Tatsuya; Ozawa, Takashi; Yamamoto, Yasuyoshi; Koike, Michiro; Ohashi, Masashi; and Kimura, Akiyoshi, to Canon Kabushiki Kaisha. Image forming apparatus capable of designating area to be copied of original. 4,812,874, Cl. 355-7.000.
Kubota Ltd.: *See*—
Fujimoto, Satoshi, 4,811,552, Cl. 56-11.800.
Kudo, Yoshinobu: *See*—
Taniguchi, Nobuyuki; Hata, Yoshiaki; Kudo, Yoshinobu; Inoue, Manabu; Hoda, Takeo; and Ueda, Hiroshi, 4,812,871, Cl. 354-421.000.
Kueppers, Harald. Printing process where each incremental area is divided into a chromatic area and an achromatic area and wherein the achromatic areas are printed in black and white and the chromatic areas are printed in color sub-sections. 4,812,899, Cl. 358-75.000.
Kuhn, Siegfried; and Kreher, Peter-Jurgen, to Boehringer Werkzeugmaschinen GmbH. Guidance systems on machines. 4,812,057, Cl. 384-42.000.
Kuhn, S.A.: *See*—
Ermacora, Rino; and Neuerburg, Horst, 4,811,553, Cl. 56-13.600.
Kuipers, Boeli: *See*—
Brandsema, Wiebrand-Anno; and Kuipers, Boeli, 4,811,658, Cl. 99-455.000.
Kulakowski, John E.; and Means, Rodney J., to International Business Machines Corporation. Data processing peripheral subsystems having a controller and a plurality of peripheral devices. 4,813,011, Cl. 364-900.000.
Kumabe, Yuichi: *See*—
Goto, Susumu; Kumabe, Yuichi; and Okunuki, Masahiko, 4,812,662, Cl. 250-491.100.
Kumagai, Keiji: *See*—
Ohta, Satoshi; Tanagawa, Kouzi; Yamamoto, Hideo; and Kumagai, Keiji, 4,812,634, Cl. 235-492.000.
Kumamoto, Hidechika; Kuroyanagi, Satoshi; and Hori, Setsuo, to Mita Industrial Co., Ltd. Automatic image-density control system. 4,812,881, Cl. 355-77.000.
Kumar, Manoj; Goyal, Ambuj; and Rathi, Bharat D., to International Business Machines Corporation. Method and apparatus for detecting transient errors. 4,813,044, Cl. 371-55.000.
Kumar-Misir, Victor. Bound book with bound holder carrying loose-leaf pages. 4,811,973, Cl. 281-21.00A.
Kumata, Mituyosi: *See*—
Yamamoto, Masahiro; Kumata, Mituyosi; Kozoe, Katutoshi; and Itoh, Tsutomu, 4,811,689, Cl. 118-624.000.
Kume, Hirofumi: *See*—
Hattori, Takemi; and Kume, Hirofumi, 4,811,986, Cl. 297-284.000.
Kume, Tsutomu: *See*—
Yamamoto, Yoshihiro; Kume, Tsutomu; Yamazaki, Nobuo; Hashimoto, Fumiharu; and Ohya, Koichi, 4,812,773, Cl. 328-167.000.
Kunimitsu, Michio; and Tomita, Hiroshi, to Sanyo Electric Ltd. Bidirectional ink sheet driving mechanism in a thermal transfer printer. 4,812,063, Cl. 400-234.000.
Kunisawa, Teturo: *See*—
Kohtoyu, Yasuhiko; Kunisawa, Teturo; and Takahashi, Takuji, 4,812,298, Cl. 423-327.000.
Kunishige, Tuneo: *See*—
Takemoto, Fumio; Kunishige, Tuneo; and Ochi, Mitsutoshi, 4,812,361, Cl. 428-397.000.
Kuno, Akira: *See*—
Tashiro, Syuzaburou; Ina, Toshikazu; Nakano, Osamu; Taguchi, Masahiro; Onimaru, Sadahisa; and Kuno, Akira, 4,812,838, Cl. 340-825.060.
Kunzli, Albert; and Schutz, Kurt, to Sulzer Brothers Limited. Electrode boiler and an insulator therefor. 4,812,618, Cl. 219-288.000.
Kunzli, Albert; and Schutz, Kurt, to Sulzer Brothers Limited. Electrode boiler and an insulator therefor. 4,812,619, Cl. 219-288.000.
Kunzmann, Dieter; Pertler, Helmut; and Seidl, Helmut, to Messerschmitt-Boelkow-Blohm GmbH. Method for diffusion welding under isostatic pressure. 4,811,892, Cl. 228-194.000.
Kupferschmidt, Albert; Greene, Trace D.; and Jaycox, Donald F., to Northern Telecom Limited. Aerial cable terminal. 4,812,942, Cl. 361-119.000.

Kupske, Peter, to Bayerische Motoren Werke Aktiengesellschaft. Arrangement for filling fuel tanks of motor vehicles, especially of motorcycles. 4,811,763, Cl. 141-44.000.

Kurahashi, Toshio, to Yamaha Hatsudoki Kabushiki Kaisha. Induction system with E.G.R. 4,811,697, Cl. 123-52.0MV.

Kurakake, Mitsuo; and Otsuka, Shoichi, to Fanuc Ltd. Picture processing apparatus. 4,812,836, Cl. 340-724.000.

Kuramoto, Kenji; and Yumoto, Manabu, to Nippon Ferrite, Ltd. Lumped constant non-reciprocal circuit element. 4,812,787, Cl. 333-1.100.

Kuraoka, Hiroaki: *See*—
Matsumoto, Naoki; Kuraoka, Hiroaki; Ohoka, Naoto; and Ohba, Masahiro, 4,811,993, Cl. 303-100.000.

Kuraray Co., Ltd.: *See*—
Takak, Fumimaro; Urabe, Akio; Shimamura, Michiya; and Mizuno, Masao, 4,812,443, Cl. 514-143.000.

Kurata, Yukio: *See*—
Ogata, Nobuo; Nakata, Yasuo; Satou, Hideaki; Tanaka, Toshiyuki; Minami, Etsuji; Yoshida, Yoshio; Kurata, Yukio; and Inoue, Teruaki, deceased, 4,812,638, Cl. 250-201.000.

Kure, Tokuo: *See*—
Nakamura, Tohru; Nakazato, Kazuo; Homma, Noriyuki; Sagara, Kazuhiko; Shiba, Takeo; Kure, Tokuo; and Hayashida, Tetsuya, 4,812,894, Cl. 357-55.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Iizuka, Yo; Iwasaki, Takao; Katto, Takayuki; and Shiiki, Zenya, 4,812,539, Cl. 526-62.000.

Kurihara, Jun'ichi: *See*—
Hirosawa, Toshio; Kurihara, Jun'ichi; and Okumura, Shigemi, 4,812,967, Cl. 364-200.000.

Kurihara, Sakuo, to Tochigi-Fuji Sangyo Kabushiki Kaisha. Hub clutch. 4,811,824, Cl. 192-35.000.

Kuroishi, Tetujiro: *See*—
Yokoyama, Shigeki; Kamiya, Takeshi; Niikawa, Takeo; Nagase, Masakatsu; and Kuroishi, Tetujiro, 4,812,355, Cl. 428-215.000.

Kurosaki, Tomihiro: *See*—
Wakatsuki, Junya; Sano, Tomohiko; and Kurosaki, Tomihiro, 4,812,254, Cl. 252-135.000.

Kurosawa, Yoshitaka: *See*—
Usami, Ikuzo; Sato, Yoshinori; Kurosawa, Yoshitaka; and Morimura, Kazuyuki, 4,811,549, Cl. 53-428.000.
Usami, Ikuzo; Sato, Yoshinori; Kurosawa, Yoshitaka; and Morimura, Kazuyuki, 4,811,838, Cl. 206-219.000.

Kuroyanagi, Satoshi: *See*—
Kumamoto, Hidechika; Kuroyanagi, Satoshi; and Hori, Setsuo, 4,812,881, Cl. 355-77.000.

Kurzweil, Karel: *See*—
Fontan, Jacques; Kurzweil, Karel; and Dehaine, Gerard, 4,812,949, Cl. 361-386.000.

Kusaka, Yosuke; and Utagawa, Ken, to Nikon Corporation. Automatic focal point control apparatus with correction of sequential defocus signals dependent on object contrast. 4,812,636, Cl. 250-201.000.

Kuschke, Renate: *See*—
Schmelz, Helmut; Thomann, Helmut; Kuschke, Renate; Wilbert, Eva-Helga; Gajewski, Wolfgang; Sprehe, Josef; Landgraf, Norbert; Ranly, Hans; Balling, Lothar; Reppisch, Richard; and Hein, Dietmar, 4,812,296, Cl. 423-239.000.

Kusumoto, Toshihiko: *See*—
Kubota, Atsushi; Sasaki, Nobukazu; Kasamura, Toshirou; Kusumoto, Toshihiko; Shiratori, Tatsuya; Ozawa, Takashi; Yamamoto, Yasuyoshi; Koike, Michiro; Ohashi, Masashi; and Kimura, Akiyoshi, 4,812,874, Cl. 355-7.000.

Kusunoki, Shigeru: *See*—
Sakamoto, Kazuho; Shitaya, Takao; Kusunoki, Shigeru; Maehara, Naoyoshi; Niwa, Takashi; Matsumoto, Takahiro; and Bessyo, Daisuke, 4,812,960, Cl. 363-20.000.

Kuusela, Reijo: *See*—
Puumalainen, Pertti; and Kuusela, Reijo, 4,812,665, Cl. 250-571.000.

Kuwabara, Shigeaki: *See*—
Kakuta, Yonehiro; Takigawa, Kouichi; Noji, Akio; Kuwabara, Shigeaki; Shimada, Tadashi; and Iida, Michihiro, 4,811,492, Cl. 33-366.000.

Kuwajima, Teruaki; Uenoyama, Kazuo; Takae, Masaki; and Okuda, Hidefumi, to Nippon Paint Co., Ltd. Method of painting. 4,812,335, Cl. 427-407.100.

Kuwano, Eiichi; Takeya, Ryuko; Eto, Morifusa; and Asano, Shoji, to Earth Chemical Co., Ltd. 1,5-Disubstituted imidazoles as inhibitors of juvenile hormone. 4,812,473, Cl. 514-396.000.

Kwiatkowski, George T.: *See*—
Koleske, Joseph V.; and Kwiatkowski, George T., 4,812,488, Cl. 522-31.000.

Kyoto, Michihisa; Yoshioka, Naoki; Tanaka, Gotaro; Kanamori, Hiroo; Watanabe, Minoru; and Nakahara, Motohiro, to Nippon Telegraph & Telephone Public Corporation; and Sumitomo Electric Industries, Ltd. Method for production of glass preform for optical fibers. 4,812,155, Cl. 65-3.120.

L. A. Gear, Inc.: *See*—
Maccano, Angelo, 4,811,500, Cl. 36-91.000.

Laake, Andreas: *See*—
Meier, Gerd; and Laake, Andreas, 4,811,815, Cl. 181-120.000.

Labaig, Jean-Jacques; Fenie, Michel; and Glotin, Michel, to Atochem. Method of making extruded conduits. 4,812,274, Cl. 264-80.000.

Labavia S.G.E.: *See*—
Estaque, Michel, 4,811,822, Cl. 188-264.00A.

LaBonte, Robert J., to Lydall, Inc. Process for the production of a battery separator. 4,812,145, Cl. 29-623.100.

Lachat, Claude; and Ferrus, Joele, to Flonic. System for interconnecting parking meters having a memory. 4,812,805, Cl. 340-825.050.

Lacquement, Ralph G.; and Ruggles, William L., to Phillips Petroleum Company. Bent tube waste heat steam generator and method. 4,811,696, Cl. 122-4.00D.

Ladisa, Nicholas F. Door. 4,811,518, Cl. 49-193.000.

Lagieski, Daniel P.; and Thompson, Todd B. Oral hygiene system. 4,811,445, Cl. 15-104.940.

Lai, Wen-Tan. Power transmission mechanism of an electric stapler. 4,811,885, Cl. 227-131.000.

Laier, Carl P., to AMP Incorporated. Key switch with controllable illumination. 4,812,831, Cl. 340-711.000.

L'Air Liquide: *See*—
Bourdon, Guy; Lampin, Dominique; and Leclerc, Daniel, 4,811,755, Cl. 137-486.000.
Virey, Franck; and Goumy, Daniel, 4,812,156, Cl. 65-83.000.

Lair, Stephen V.; and Digan, Mary E., to Phillips Petroleum Company. Double auxotrophic mutants of *Pichia pastoris* and methods for preparation. 4,812,405, Cl. 435-255.000.

Lampin, Dominique: *See*—
Bourdon, Guy; Lampin, Dominique; and Leclerc, Daniel, 4,811,755, Cl. 137-486.000.

Landero, Herman: *See*—
Romanowski, Christopher A.; and Landero, Herman, 4,811,781, Cl. 164-480.000.

Landgraf, Norbert: *See*—
Schmelz, Helmut; Thomann, Helmut; Kuschke, Renate; Wilbert, Eva-Helga; Gajewski, Wolfgang; Sprehe, Josef; Landgraf, Norbert; Ranly, Hans; Balling, Lothar; Reppisch, Richard; and Hein, Dietmar, 4,812,296, Cl. 423-239.000.

Landis, Michael E.: *See*—
Angevine, Philip J.; Degnan, Thomas F., Jr.; and Landis, Michael E., 4,812,228, Cl. 208-251.00H.

Landoni, Gianluigi: *See*—
Cipriani, Gioacchino; and Landoni, Gianluigi, 4,812,499, Cl. 524-96.000.

Lane, Lori B.: *See*—
DeSimone, Richard E.; and Lane, Lori B., 4,812,536, Cl. 585-467.000.

Lane, Robert: *See*—
Wood, Alfred; and Lane, Robert, 4,811,554, Cl. 57-401.000.

Lang, Armin, to Zahnradfabrik Friedrichshafen, AG. Servosteering, especially for motor vehicles. 4,811,806, Cl. 180-141.000.

Lange, Heinz: *See*—
Moses, Klaus; and Lange, Heinz, 4,813,072, Cl. 379-388.000.

Langer, Alois A.; and Rinne, Albert W., to Liebel-Flarsheim Corporation. Injector control. 4,812,724, Cl. 318-599.000.

Larizza, Edward P., to United Brands Company. Produce shipment and separable distribution and display carton. 4,811,837, Cl. 206-45.110.

LaRosa, Joseph P.; and Lombardi, Michael H., to Chesebrough-Pond's Inc. Spray apparatus. 4,811,900, Cl. 239-10.000.

Larson, David L.: *See*—
Crawford, Thomas C.; Keely, Stanley L.; Larson, David L.; Lombardino, Joseph G.; and Maciejko, James J., 4,812,455, Cl. 514-226.500.

Larson, Tony R.; and Tretter, Larry L., to International Business Machines Corporation. Dual direction integrating delay circuit. 4,812,687, Cl. 307-601.000.

Larsson, Bertil; Andersson, Erik T.; and H ahansson, Rolf G. R., to AGEC AB. Method and a device for assortment of a product flow. 4,812,644, Cl. 250-223.00R.

Laser Precision Corporation: *See*—
Doyle, Walter M., 4,812,041, Cl. 356-346.000.
Shafer, Kenneth H., 4,812,241, Cl. 210-658.000.

Lasoen, Jean J., to Massey-Ferguson Services N.V. Power take-off drive unit. 4,811,614, Cl. 74-15.630.

Lau, Monica M.; and Coffinberry, George A., to General Electric Company. Multiple-propellant air vehicle and propulsion system. 4,811,556, Cl. 60-206.000.

Laughlin, William C.; and Schulke, Dwight A., to Kerr-McGee Chemical Corporation. Process for preparing high purity Mn_3O_4. 4,812,302, Cl. 423-605.000.

Laupenmuhlen, Heinz K.: *See*—
Kleeberg, Wolfgang; Hacker, Heinz; Huber, Jurgen; Wilhelm, Dieter; and Laupenmuhlen, Heinz K., 4,812,490, Cl. 523-443.000.

Lauper, Alfred; and Steffen, Andreas, to Siemens-Albis. Expander system for pulse signals. 4,812,771, Cl. 328-109.000.

Lavielle, Gilbert; and Lepagnol, Jean, to Adir Et Cie. Acetamides derived from 2,3-dihydro-3-phenyl-2-benzofuranone. 4,812,469, Cl. 514-466.000.

Lavin, Sr. Gerald P. Inside corner bracket. 4,812,075, Cl. 403-403.000.

Lavnikov, Nikolai S.: *See*—
Antipov, Georgy A.; Gelfand, Mikhail L.; Goldshtein, Boris G.; Korniliev, Gennady A.; Lavnikov, Nikolai S.; Tsipenjuk, Yakov I.; and Yakubovsky, Petr S., 4,811,797, Cl. 173-93.600.

Law, Brian: *See*—
Wass, Anthony; and Law, Brian, 4,811,871, Cl. 222-477.000.

Lawford, Hugh G., to George Weston Limited. Continuous process for ethanol production by bacterial fermentation. 4,812,410, Cl. 435-161.000.

Lawson, Horace F.; and Hale, Arthur H., to Pony Industries, Inc. Well drilling fluids and process for drilling wells. 4,812,244, Cl. 252-8.514.

Lawter, Raymond L.: *See*—
Lyons, Dale R.; Lawter, Raymond L.; and Beam, Don E., 4,811,579, Cl. 70-85.000.

Layher, Gerhard: *See*—
Kinzler, Gernot; and Layher, Gerhard, 4,812,209, Cl. 162-343.000.
Laymaster, Larry A. Wire vise. 4,811,936, Cl. 269-43.000.
Lazer, Edward S., to Boehringer Ingelheim Pharmaceutical, Inc. 3-[2-(3',5'-di-t-butyl-4'-hydroxyphenyl)ethenyl]pyridine. 4,812,460, Cl. 514-277.000.
Leadbetter, Arthur N.; and Galloway, James G., to Dow Chemical Company, The. Latex based adhesive composition for paperboard and corrugated board. 4,812,496, Cl. 524-47.000.
Lear Siegler Seymour Corporation: *See*—
Simpson, Danny, 4,811,438, Cl. 5-308.000.
Leclerc, Daniel: *See*—
Bourdon, Guy; Lampin, Dominique; and Leclerc, Daniel, 4,811,755, Cl. 137-486.000.
Lederhos, L. J., Jr.: *See*—
Kamilos, G. N.; Kennedy, D. D.; and Lederhos, L. J., Jr., 4,811,786, Cl. 166-303.000.
Lederich, Richard J.: *See*—
Sastry, Shankar M.; and Lederich, Richard J., 4,811,766, Cl. 148-11.50A.
Ledex Inc.: *See*—
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Lord Corporation: *See*—
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Lutfy, Eric A. Solid projectiles. 4,811,666, Cl. 102-501.000.
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Maaloe, Jens; Budinka, Rudolf; and Andersen, Svend V., to Aktieselskabet Nordiske Kabel-OG Traadfabriker. Process for monitoring a data processing unit and a system for performing the process. 4,813,042, Cl. 371-16.000.
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Maloney, William J., II, to Quaker Oats Company, The. Collapsible and expandable tent. 4,811,751, Cl. 135-106.000.
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Martin, Joseph: *See*—
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Masaki, Hideo, to Kabushiki Kaisha Toshiba. Printer apparatus with automatic gap adjusting mechanism. 4,812,059, Cl. 400-56.000.

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Mashimo, Akira, to Teac Corporation. Optical disc recording apparatus with a light beam having a controllable quantity. 4,813,034, Cl. 369-116.000.

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Koba, Keiichiro; Utsunomiya, Taizo; Saitow, Yoshiaki; Iwanaga, Katsusuke; Matsue, Michihiko; and Nishitani, Noriaki, 4,812,271, Cl. 264-63.000.

Matsuhashi, Hajime: *See*—
Yamada, Motokazu; Hayakawa, Hideyuki; Fukui, Tomonori; Matsuhashi, Hajime; Kaneko, Yasuhiro; Ikeda, Motozo; and Nagata, Tomihiko, 4,812,845, Cl. 340-995.000.

Matsui, Masataka; Iizuka, Tetsuya; Tsujimoto, Jun-ichi; Ohtani, Takayuki; and Isobe, Mitsuo, to Kabushiki Kaisha Toshiba. Static memory with pull-up circuit for pulling-up a potential on a bit line. 4,813,022, Cl. 365-203.000.

Matsui, Sadayoshi: *See*—
Taneya, Mototaka; Matsumoto, Mitsuhiro; Kawanishi, Hidenori; and Matsui, Sadayoshi, 4,813,051, Cl. 372-150.000.

Matsumoto, Kenichi: *See*—
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Matsumoto, Kohichi, to Nikon Corporation. Reflection type reduction projection optical system. 4,812,028, Cl. 350-444.000.

Matsumoto, Mitsuhiro: *See*—
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Matsumoto, Naoki; Kuraoka, Hiroaki; Ohoka, Naoto; and Ohba, Masahiro, to Nippondenso Co., Ltd. Anti-skid control system for braking of vehicle. 4,811,993, Cl. 303-100.000.

Matsumoto, Shinichi; Ise, Kiyotaka; and Miyazaki, Hiroharu, to Toyota Jidosha Kabushiki Kaisha. Acceleration slip control device for a wheeled vehicle. 4,811,808, Cl. 180-197.000.

Matsumoto, Takahiro: *See*—
Sakamoto, Kazuho; Shitaya, Takao; Kusunoki, Shigeru; Machara, Naoyoshi; Niwa, Takashi; Matsumoto, Takahiro; and Bessyo, Daisuke, 4,812,960, Cl. 363-20.000.

Matsumura, Kimiharu: *See*—
Sakai, Hiroyuki; Yoshioka, Kazutoshi; Matsumura, Kimiharu; Shigaki, Keisuke; Amemiya, Yutaka; Iimuro, Shunichi; Yoshioka, Haruhiko; and Onoe, Teruhiko, 4,812,201, Cl. 156-643.000.

Matsuo, Shigeru; Murakami, Tomoyoshi; Bando, Thoru; and Nagatoshi, Kikuo, to Idemitsu Kosan Company Limited. Reinforced resinous composition comprising polycyano arylene ether. 4,812,507, Cl. 524-611.000.

Matsushima, Tadashi, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronic musical instrument for generation of inharmonic tones. 4,811,644, Cl. 84-1.200.

Matsushita Electric Industrial Co., Ltd.: *See*—
Fujiwara, Akie; Takenouchi, Mariko; and Shimizu, Masahiro, 4,813,078, Cl. 382-21.000.
Honjo, Masahiro; Takeuchi, Akihiro; Ochi, Atsuo; Aki, Shinichi; Nakagawa, Yukio; and Kobayashi, Masaaki, 4,812,783, Cl. 331-20.000.
Makimoto, Mitsuo; and Ohba, Motoi, 4,812,791, Cl. 333-219.000.
Miyama, Hiroshi; Kawauchi, Yoshikazu; Tomii, Kaoru; and Nishida, Jun, 4,812,716, Cl. 315-366.000.
Miyata, Takeo; Ono, Takuhiro; Iwabuchi, Takashi; Ikedo, Masaru; and Watari, Masafumi, 4,812,016, Cl. 350-320.000.
Ogawa, Kazufumi; Sasago, Masaru; Endo, Masayuki; and Ishihara, Takeshi, 4,812,880, Cl. 355-53.000.
Ohnishi, Youichi; Okuda, Akira; Shima, Hiromi; and Mizuguchi, Shinichi, 4,812,712, Cl. 315-176.000.
Sakamoto, Kazuho; Shitaya, Takao; Kusunoki, Shigeru; Machara, Naoyoshi; Niwa, Takashi; Matsumoto, Takahiro; and Bessyo, Daisuke, 4,812,960, Cl. 363-20.000.
Shibaike, Narito, 4,812,931, Cl. 360-99.060.
Yamashita, Ichiro; Wakamiya, Masayuki; Hase, Hiroyuki; and Tokuono, Shinya, 4,812,758, Cl. 324-209.000.
Yuhaku, Satoru; Nakatani, Seiichi; Nishimura, Tsutomu; and Ishida, Toru, 4,812,422, Cl. 501-20.000.

Matsushita Graphic Communication Systems, Inc.: *See*—
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Matsushita, Hajime: *See*—
Yokobayashi, Toshiaki; Yabe, Ryohei; and Matsushita, Hajime, 4,812,909, Cl. 358-183.000.

Matsuura, Hideaki: *See*—
Imai, Shozaburo; Isobe, Michihisa; Yokoo, Kazuhiro; and Matsuura, Hideaki, 4,812,345, Cl. 428-65.000.

Matsuura, Kazuo: *See*—
Inagaki, Hiromi; Matsuura, Kazuo; Koike, Tetsuya; Suenaga, Toshihiko; Yorita, Masaru; and Izawa, Masaki, 4,811,933, Cl. 267-140.100.

Matsuura, Sadaji; Arai, Yasuo; Aoki, Shigeki; and Ando, Satoru, to Fuji Fire-Proof Material Industry Co., Ltd. Process for producing a fire-resistant, light-weight construction material. 4,812,169, Cl. 106-15.050.

Mattiolo, Marco: *See*—
Fratti, Marco; and Mattiolo, Marco, 4,811,532, Cl. 52-172.000.

Maucher, Paul; and Huber, Lothar, to Luk Lamellen und Kupplungsbau GmbH. Friction clutch. 4,811,474, Cl. 29-446.000.

Mauck, John C.; Mauck, Linda A.; and Norton, Gary E., to Eastman Kodak Company. Analytical element and method for the determination of creatinine or creatine. 4,812,399, Cl. 435-18.000.

Mauck, Linda A.: *See*—
Mauck, John C.; Mauck, Linda A.; and Norton, Gary E., 4,812,399, Cl. 435-18.000.

Maxim Integrated Products: *See*—
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Mayer, Donald K., to Thermo King Corporation. Refrigerant drier. 4,811,571, Cl. 62-474.000.

Mayer, Thomas J.: *See*—
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Mazda Motor Corporation: *See*—
Kimura, Nobuo, 4,812,090, Cl. 409-132.000.

McAllister, John M. Cane with extensible fingers. 4,811,750, Cl. 135-66.000.

McBride, John K.: *See*—
Sanders, Robert E., Jr.; Kaanta, Henry W.; McBride, John K.; Milner, Milton W.; Perigo, Terry A.; and Shelby, Samuel L., 4,812,183, Cl. 148-439.000.

McCall, Floyd. Fluid dispersing means. 4,812,049, Cl. 366-174.000.

McCleary, Ronald T. Protection device for hand wrenches. 4,811,637, Cl. 81-177.200.

McClintock, Willard K.: *See*—
Heggart, Ronald G.; McClintock, Willard K.; and Engstrom, Randy J., 4,813,055, Cl. 373-74.000.

McCloy, Keith A.: *See*—
Fountain, Frank S.; Pusey, Donald K.; and McCloy, Keith A., 4,812,923, Cl. 360-25.000.

McCollum, Anthony W.: *See*—
Stavinoha, Jerome L.; and McCollum, Anthony W., 4,812,509, Cl. 524-484.000.

McCombs, William F.: *See*—
Ewers, Ronald L.; and McCombs, William F., 4,811,804, Cl. 180-53.800.

McConnell, Anthony; and Bedford, Anthony M., to John Cotton Limited. Process for the manufacture of cellular core laminated elements. 4,812,186, Cl. 156-90.000.

McConway & Torley Corporation: *See*—
Elliott, William O., 4,811,854, Cl. 213-155.000.

McDonnell Douglas Corporation: *See*—
Sastry, Shankar M.; and Lederich, Richard J., 4,811,766, Cl. 148-11.50A.

McGurk-Burleson, Erin; Koehler, Elmer; and Packham, Victor, to Baxter Travenol Laboratories, Inc. Surgical cutting instrument. 4,811,734, Cl. 128-305.000.

McJilton, Timothy L., to Shaped Wire, Inc. Wire feed for metalizing apparatus. 4,811,691, Cl. 118-726.000.

McKenzie, Richard E.: *See*—
Adams, Daniel R.; and McKenzie, Richard E., 4,812,990, Cl. 364-444.000.

McLaughlin, John T. Medication dispenser station. 4,811,764, Cl. 141-98.000.

McLaurin, Daniel A.; Fleming, Beverly M.; and O'Connell, James P., to Becton, Dickinson and Company. Vacuum actuated assay device and method of using same. 4,812,293, Cl. 422-69.000.

McNeilus Truck and Manufacturing, Inc.: *See*—
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Mead, Gary G.; and Foos, George M., to Spartan Container Corp. Combination container and plural-mode garment support. 4,811,853, Cl. 211-124.000.

Means, Rodney J.: *See*—
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Med Optics Corp.: *See*—
Sterman, Saul C., 4,811,662, Cl. 101-170.000.

Medders, Jerry B.: *See*—
Kennon, James A.; Islam, Shafidul; Popken, Jeffrey L.; Medders, Jerry B.; Fitzgerald, Susan S.; Kelley, Donald R.; and Burr, Philip A., 4,812,114, Cl. 425-116.000.

Mee, William: *See*—
Hassel, William; and Mee, William, 4,811,742, Cl. 128-733.000.

Meendering, Allan W. Livestock building ventilator. 4,811,656, Cl. 98-37.000.

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Maring, Richard B.; and Shoemaker, Martin L., 4,812,904, Cl. 358-107.000.

Meguro, Kanji; Fujita, Takeshi; Hatanaka, Chitoshi; and Ooi, Satoru, to Takeda Chemical Industries, Ltd. Method for producing thiazolidinedione derivatives. 4,812,570, Cl. 546-280.000.

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Lopez-Berestein, Gabriel; Mehta, Reeta; Hopfer, Roy L.; and Juliano, Rudolph L., 4,812,312, Cl. 424-417.000.

Mehta, Satish. Emotional gift or greeting device in the stylized representation of a human heart. 4,811,506, Cl. 40-427.000.

Meier, Gerd; and Laake, Andreas, to 501 Max-Planck-Gesellschaft Zur Forderung der Wissenchaften E.V. Process and a device for hydrodynamic sound pulse generation in a liquid. 4,811,815, Cl. 181-120.000.

Meinan Machinery Works, Inc.: *See*—
Honda, Noriyuki; Abe, Yukio; Isobe, Makoto; and Nakata, Nobuhiro, 4,811,496, Cl. 34-144.000.

Meins, Jurgen; and Grosser, Helmut, to Thyssen Industrie AG. Method and device for accurately determining the distance of a magnetic sensor from a conductive reaction rail. 4,812,757, Cl. 324-207.000.

Meiser, Sue M.: *See*—
Dorsey-Zinn, Denise; Meiser, Sue M.; and Cassidy, Michael F., 4,811,951, Cl. 273-157.00R.

Melanson, Ronald J.: *See*—
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Melody, Brian; and Clouse, James A., to Aerovox M, Inc. Electrolytic capacitor and electrolyte therefor. 4,812,951, Cl. 361-504.000.

Menchetti, Robert J., to National Gypsum Company. Wall framing system. 4,811,539, Cl. 52-486.000.

Mende, Reinhold: *See*—
Linde, Hartmut; and Mende, Reinhold, 4,812,342, Cl. 428-35.400.

Mendel, Clifford W., to United States of America, Energy. Current-level triggered plasma-opening switch. 4,812,715, Cl. 315-340.000.

Mercat, Jean-Pierre, to Ste Look. Method and device for measuring the torque transmitted by the driving wheel of a cycle and a cycle equipped with said device. 4,811,612, Cl. 73-862.340.

Mercer, Basil W.: *See*—
Cawley, William E.; and Mercer, Basil W., 4,812,237, Cl. 210-605.000.

Merchant, Abid N.; Burke, Kenneth C.; and Redenbaugh, Jill M., to Du Pont de Nemours, E. I., and Company. Azeotropic compositions of 1,1-diffuoro-1,2,2-trichloroethane and methanol, ethanol, isopropanol or n-propanol. 4,812,256, Cl. 252-162.000.

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Boger, Joshua S.; Evans, Ben E.; and Bock, Mark G., 4,812,442, Cl. 514-18.000.
Ellis, Ronald W.; Keller, Paul M.; Lowe, Robert S.; and Davison, Andrew J., 4,812,559, Cl. 536-27.000.
Graham, Samuel L.; and Scholz, Thomas H., 4,812,463, Cl. 514-311.000.
Saari, Walfred S., 4,812,590, Cl. 860-137.000.

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Krause, Joachim; Romer, Michael; Pohl, Ludwig; Scheuble, Bernhard; and Weber, Georg, 4,812,258, Cl. 252-299.610.
Raddatz, Peter; Holzemann, Gunter; Jonczyk, Alfred; Schmitges, Claus J.; and Minck, Klaus O., 4,812,555, Cl. 530-323.000.

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Merino Ciudad, Ana I. Sport shoe. 4,811,497, Cl. 36-51.000.

Merit Technology Incorporated: *See*—
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Merriss, Morley M.: *See*—
Bishop, H. John; Merriss, Morley M.; Ohlsson, Thomas L.; and Sopira, Terrence G., 4,813,035, Cl. 370-50.000.

Merz, Walter, to Swiss Aluminium Ltd. Conduit for transporting finely-divided or fine-granular, dry bulk materials and a process for operation of same. 4,812,085, Cl. 406-88.000.

Messer, Jean-Pierre: *See*—
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Kallies, Guenter; and Scheidemann, Dieter, 4,811,540, Cl. 52-630.000.
Kunzmann, Dieter; Pertler, Helmut; and Seidl, Helmut, 4,811,892, Cl. 228-194.000.

Mette, Ulrich: *See*—
Blumberg, Willy; Schutt, Hans J.; Mette, Ulrich; Barbet, Karl H.; Busse, Fritz; and Klier, Benno, 4,812,073, Cl. 403-134.000.

Meul, Thomas, to Lonza Ltd. Synthesis of tetramic acid. 4,812,578, Cl. 548-544.000.

Meurer, Kurt P.; Waniczek, Helmut; Ohm, Christian; and Witte, Josef, to Bayer Aktiengesellschaft. New copolymers of alpha-cyanoacrylates and acrylates, their preparation and their use. 4,812,546, Cl. 526-297.000.

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Commons, Thomas J.; Mewshaw, Richard E.; and Strike, Donald P., 4,812,583, Cl. 549-292.000.

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Meyer, Rainer-Leo; John, Reinmar; Nagel, Rolf; and Muller, Gunter, 4,812,356, Cl. 428-220.000.

Meyer, Joao: *See*—
Aurouet, Claude; Blumenfeld, Henry; Bourdinaud, Michel; Calvet, Jean; Cavan, Jean-Claude; Meyer, Joao; and Thevenin, Jean-Claude, 4,812,013, Cl. 350-96.290.

Meyer, Meinhard: *See*—
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Jahn, Dieter; Keil, Michael; Kolassa, Dieter; Schirmer, Ulrich; Wuerzer, Bruno; Meyer, Norbert; Jung, Johann; and Rademacher, Wilhelm, 4,812,160, Cl. 71-88.000.

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Micheli, Adolph L., to General Motors Corporation. Sulfide thin film formed from stabilized metallo-organic solution. 4,812,333, Cl. 427-226.000.

Michels, Mark: *See*—
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Micheron, Francois: *See*—
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Microdot Inc.: *See*—
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Stritzke, Bernard G.; and Rericha, Brian F., 4,811,960, Cl. 277-153.000.

MicroFab Technologies, Inc.: *See*—
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Eke, Kenneth I., 4,812,606, Cl. 219-10.55B.

Microwave Products of America, Inc.: *See*—
Cornell, Jeffrey K., 4,812,607, Cl. 219-10.55B.

Midaco Corporation: *See*—
Keith, Malcolm E., 4,811,939, Cl. 271-146.000.
Mikelsaar, Raik-Khiio N., to Tartuskiy gosudarstvennyy Universitet. Three-dimensional molecular model. 4,812,128, Cl. 434-278.000.
Milano, Arthur J. J., to Seitz Corporation. CPR face mask and method of using same. 4,811,730, Cl. 128-203.110.
Miller, Henry E., Jr. Stake pocket tie-down anchor. 4,812,093, Cl. 410-110.000.
Miller, Frank. Removal of water from carbonaceous solids by use of methyl formate. 4,811,494, Cl. 34-9.000.
Miller, Jack V.: *See*—
Miller, Ruth E.; and Miller, Jack V., 4,812,134, Cl. 439-110.000.
Miller, James D., to Central Institute for the Deaf. Speech processing apparatus and methods. 4,813,076, Cl. 381-43.000.
Miller, Jeffrey T., to Amoco Corporation. Hydrocracking process. 4,812,224, Cl. 208-111.000.
Miller, John E., to Parma Corporation. Coil spring mattress core. 4,811,932, Cl. 267-95.000.
Miller, Robert C., to Westinghouse Electric Corp. Optical interface for a magneto-optical current transducer. 4,812,025, Cl. 350-435.000.
Miller, Ruth E.; and Miller, Jack V. Wall mounted lighting track system. 4,812,134, Cl. 439-110.000.
Milliken Research Corporation: *See*—
Baumgartner, Alan S.; Moore, Patrick D.; and VanDahm, Richard A., 4,812,141, Cl. 8-506.000.
Gilpatrick, Michael W., 4,813,062, Cl. 378-162.000.
Mills, Gary N.; and Willock, Charles B., to CD Medical Inc. Dry chemical mix system for hemodialysis. 4,812,239, Cl. 210-647.000.
Milner, Milton W.: *See*—
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Milowsky, Arnold S.: *See*—
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Minck, Klaus O.: *See*—
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Minigrip, Inc.: *See*—
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Minneman, William J., to MTM Molded Products Company. Adaptable cartridge container. 4,811,836, Cl. 206-3.000.
Minnesota Mining and Manufacturing Company: *See*—
Bird, Gerald C.; and Wiste, Orville M., 4,812,948, Cl. 361-223.000.
Debe, Mark K., 4,812,352, Cl. 428-142.000.
Giannesi, Pier G., 4,812,390, Cl. 430-434.000.
Vogelgesang, Peter J.; Ulseth, John W.; Giorgini, Norman L.; and Edwards, Jathan D., 4,812,633, Cl. 235-487.000.
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Minolta Camera Kabushiki Kaisha: *See*—
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Iida, Takashi; Itoh, Masatoshi; Fukuoka, Hidenori; Tsukamoto, Takeya; Hamada, Masataka; Ishibashi, Kenji; and Ootsuka, Hiroshi, 4,812,912, Cl. 358-227.000.
Inagaki, Sanji; Fukao, Hiroshi; Yamada, Tetsuya; Urano, Etsuaki; and Hattori, Yoshihiro, 4,812,873, Cl. 355-3.0FU.
Sasaki, Yoshikazu; and Misawa, Naoya, 4,812,861, Cl. 354-4.000.
Tada, Kaoru, 4,812,915, Cl. 358-287.000.
Taniguchi, Nobuyuki; Hata, Yoshiaki; Kudo, Yoshinobu; Inoue, Manabu; Hoda, Takeo; and Ueda, Hiroshi, 4,812,871, Cl. 354-421.000.
Ueyama, Masayuki, 4,812,865, Cl. 354-286.000.
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Minoura, Nobuo; and Nakadai, Katsuo, to Fuji Photo Film Co., Ltd. Still video signal playback apparatus with still video recording function. 4,812,922, Cl. 360-10.100.
Minuhin, Vadim B.; and VonDeylen, Vernon F., to Magnetic Peripherals Inc. Readback recovery of run length limited codes. 4,813,059, Cl. 375-122.000.
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Mishiro, Shoji, to Taga Electric Co., Ltd. Ultrasonic vibrator and a method of controllingly driving same. 4,812,697, Cl. 310-323.000.
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Inoue, Yasuo, 4,812,036, Cl. 356-32.000.
Iwatani, Shiro, 4,812,732, Cl. 322-99.000.
Kawagoe, Yasuyuki; Yamanishi, Kenichiro; and Yasunaga, Seiji, 4,811,690, Cl. 118-723.000.
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Takeda, Masatoshi; Ikeda, Kazuo; Tominaga, Yoshiharu; and Mori, Kenji, 4,812,669, Cl. 307-105.000.
Tsukazaki, Hisashi; Yamanishi, Kenichiro; and Yasunaga, Seiji, 4,812,326, Cl. 427-38.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Shimada, Makoto; and Dogahara, Takashi, 4,811,713, Cl. 123-399.000.
Yoshida, Yasuhiko; Honda, Masahiro; and Takizawa, Shozo, 4,811,805, Cl. 180-140.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Honda, Mitsuyasu; Seto, Touru; and Mitsuoka, Shigeaki, 4,812,429, Cl. 502-34.000.
Takahashi, Ryoichi; Sato, Tomoyoshi; Tsukamoto, Hidehiko; Morimoto, Kazuo; and Maeda, Nobutaka, 4,811,585, Cl. 72-108.000.
Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Okada, Yoshikazu; Sugawara, Jun; and Takizawa, Sumiyoshi, 4,812,370, Cl. 428-552.000.
Mitsubishi Paper Mills, Ltd.: *See*—
Sugiyama, Takeo; and Hiraishi, Shigetoshi, 4,812,354, Cl. 428-195.000.
Mitsubishi Petrochemical Co., Ltd.: *See*—
Nojiri, Naohiro; Sakai, Yukio; and Iwakura, Tomoatsu, 4,812,437, Cl. 502-243.000.
Mitsubishi Rayon Co., Ltd.: *See*—
Takemoto, Fumio; Kunishige, Tuneo; and Ochi, Mitsutoshi, 4,812,361, Cl. 428-397.000.
Terada, Hiromu; Sakunaga, Kenichi; and Fukahori, Naoyuki, 4,812,012, Cl. 350-96.240.
Mitsubishi Steel MFG Co., Ltd.: *See*—
Arita, Yoji, 4,812,692, Cl. 310-49.00R.
Mitsubishi Yuka Badische Co., Ltd.: *See*—
Endo, Hiroshi; and Gotoh, Toshihiro, 4,812,484, Cl. 521-60.000.
Mitsuhashi, Masakazu; Sakai, Shuzo; and Miyake, Toshio, to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo. Dehydration of hydrous matter using anhydrous glycosylfructose. 4,812,444, Cl. 514-53.000.
Mitsuhashi, Takamichi; and Tomioka, Masao, to Sony Corporation. Sound field expansion system for a video tape recorder. 4,812,921, Cl. 358-343.000.
Mitsui Mining Company, Limited: *See*—
Koba, Keiichiro; Utsunomiya, Taizo; Saitow, Yoshiaki; Iwanaga, Katsusuke; Matsue, Michihiko; and Nishitani, Noriaki, 4,812,271, Cl. 264-63.000.
Mitsui Mining & Smelting Co., Ltd.: *See*—
Kagawa, Keiichi; and Taniyasu, Kiyoshi, 4,812,374, Cl. 429-50.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Hirose, Toshiyuki, 4,812,513, Cl. 525-65.000.
Nakagawa, Hiroaki; Kondo, Masahiro; and Ohishi, Noriake, 4,812,279, Cl. 264-311.000.
Mitsui Toatsu Chemicals, Incorporated: *See*—
Obata, Kenji; Yoneda, Nobuhiko; Kataita, Masabumi; I, Yoshihiro; and Yamashita, Hironori, 4,812,203, Cl. 159-6.200.
Mitsuoka, Shigeaki: *See*—
Honda, Mitsuyasu; Seto, Touru; and Mitsuoka, Shigeaki, 4,812,429, Cl. 502-34.000.
Miura, Shinsuke; and Ishizuka, Susumu, to Yamaichi Electric Mfg. Co., Ltd. Specific gravity detector. 4,811,592, Cl. 73-32.00A.
Miura, Shinsuke; and Ishizuka, Susumu, to Yamaichi Electric Mfg. Co., Ltd. Viscosity detector. 4,811,593, Cl. 73-54.000.
Miura, Tomoko: *See*—
Oishi, Minoru; Morimoto, Yoshinari; Furukawa, Akihiro; Miura, Tomoko; Ikeda, Yoshie; and Nagatsuna, Akemi, 4,812,832, Cl. 340-709.000.

Miwa, Hiroaki: *See*—
Sudo, Ryoichi; Miwa, Hiroaki; and Tajima, Tetsuo, 4,812,346, Cl. 428-65.000.
Miyake, Shinichi: and Miyasaka, Shinji, to Sumitomo Electric Industries, Ltd. Method and apparatus for incubating cells. 4,812,392, Cl. 435-3.000.
Miyake, Toru; and Nakano, Yasushi, to Konishiroku Photo Industry Co. Magnetic recording medium. 4,812,358, Cl. 428-323.000.
Miyake, Toshio: *See*—
Mitsuhashi, Masakazu; Sakai, Shuzo; and Miyake, Toshio, 4,812,444, Cl. 514-53.000.
Miyakoshi, Kazumitsu; and Nakaya, Mitsuyoshi, to Sharp Kabushiki Kaisha. Digital-to-analog converter system. 4,812,815, Cl. 455-612.000.
Miyakusu, Katsuhisa: *See*—
Tanaka, Teruo: Miyakusu, Katsuhisa; and Fujimoto, Hiroshi, 4,812,176, Cl. 148-12.0EA.
Miyama, Hiroshi; Kawauchi, Yoshikazu; Tomii, Kaoru; and Nishida, Jun, to Matsushita Electric Industrial Co., Ltd. Electron beam scanning display apparatus with cathode vibration suppression. 4,812,716, Cl. 315-366.000.
Miyamoto, Ryosuke: *See*—
Sakai, Shinji; Kawabata, Takashi; and Miyamoto, Ryosuke, 4,812,727, Cl. 318-696.000.
Miyano, Masateru: *See*—
Campbell, Arthur L.; and Miyano, Masateru, 4,812,474, Cl. 514-460.000.
Miyasaka, Shinji: *See*—
Miyake, Shinichi; and Miyasaka, Shinji, 4,812,392, Cl. 435-3.000.
Miyata, Kenji: *See*—
Tsumaki, Koji; Miyata, Kenji; and Nishi, Masatsugu, 4,812,774, Cl. 328-233.000.
Miyata, Takeo; Ono, Takuhiro; Iwabuchi, Takashi; Ikedo, Masaru; and Watari, Masafumi, to Matsushita Electric Industrial Co., Ltd. Antireflection film. 4,812,016, Cl. 350-320.000.
Miyata, Yasuji: *See*—
Hasegawa, Hiroaki; Miyata, Yasuji; Sugimoto, Koyata; and Nakamura, Akira, 4,811,606, Cl. 73-861.380.
Miyayama, Toshio: *See*—
Masuzawa, Isao; Miyayama, Toshio; Nakayama, Mitsuo; and Nishimura, Koichi, 4,811,679, Cl. 114-144.0RE.
Miyazaki, Hiroharu: *See*—
Matsumoto, Shinichi; Ise, Kiyotaka; and Miyazaki, Hiroharu, 4,811,808, Cl. 180-197.000.
Miyazono, Tadafumi: *See*—
Muramoto, Hisaichi; Ishii, Keizou; and Miyazono, Tadafumi, 4,812,549, Cl. 526-318.000.
Miyoshi, Takahito: *See*—
Hanai, Kazuko; Yamada, Yasuyuki; and Miyoshi, Takahito, 4,812,369, Cl. 428-425.900.
Mizuguchi, Shinichi: *See*—
Ohnishi, Youichi; Okuda, Akira; Shima, Hiromi; and Mizuguchi, Shinichi, 4,812,712, Cl. 315-176.000.
Mizuishi, Kenichi: *See*—
Kato, Takeshi; Mizuishi, Kenichi; and Chiba, Katuaki, 4,812,002, Cl. 350-96.180.
Mizuno, Masao: *See*—
Takak, Fumimaro; Urabe, Akio; Shimamura, Michiya; and Mizuno, Masao, 4,812,443, Cl. 514-143.000.
Mizuno, Yuji: *See*—
Iwamoto, Hiroshi; Tamura, Yutaka; Mizuno, Yuji; and Yokota, Akihiro, 4,812,916, Cl. 358-289.000.
Mobay Corporation: *See*—
Anderson, Howard A., 4,811,516, Cl. 49-49.000.
Mobil Oil Corporation: *See*—
Angevine, Philip J.; Degnan, Thomas F., Jr.; and Landis, Michael E., 4,812,228, Cl. 208-251.00H.
Child, Jonathan E., 4,812,430, Cl. 502-42.000.
Child, Jonathan E., 4,812,431, Cl. 502-42.000.
Hickey, Karlton J., Jr.; and Morrison, Roger A., 4,812,223, Cl. 208-111.000.
Jennings, Alfred R., Jr.; and Shu, Paul, 4,811,789, Cl. 166-276.000.
Jennings, Alfred R., Jr.; and Stowe, Lawrence R., 4,811,790, Cl. 166-278.000.
Kirker, Garry W.; and Varghese, Philip, 4,812,222, Cl. 208-89.000.
Prader, Randolph D.; and Benoit, Gordon L., 4,812,055, Cl. 383-119.000.
Quaglino, Carl A., 4,813,026, Cl. 367-29.000.
Su, Tien-Kuei, 4,812,504, Cl. 524-229.000.
Mochizuki, Akihiro; Iwasaki, Masayuki; Yamagishi, Yasuo; Ikegami, Kasumi; Gondo, Hiroyuki; and Yamaguchi, Hisashi, to Fujitsu Limited. Projection type liquid crystal display device. 4,812,034, Cl. 383-122.000.
Mochizuki, Shuji, to Three Bond Co. Ltd. Anaerobically curable composition having a good stability. 4,812,497, Cl. 524-87.000.
Mochizuki, Tsuyoshi: *See*—
Murao, Masatsugu; Murao, Kazuhiko; and Mochizuki, Tsuyoshi, 4,811,748, Cl. 134-122.00R.
Moehling, Charles, to Amsted Industries Incorporated. Three axle railway truck. 4,811,668, Cl. 105-4.100.
Mohammadi, Navroz A.: *See*—
Rempel, Garry L.; Mohammadi, Navroz A.; and Farwaha, Rajeev, 4,812,528, Cl. 525-338.000.
Mohler, David B., to Ledex Inc. Three-dimensional double air gap high speed solenoid. 4,812,884, Cl. 335-258.000.
Mokveld, Floribertus C. H.; and Schellekens, Ronald M. A. M., to Stamicarbon B.V. Process for the preparation of polyvinyl alcohol articles of high strength and modulus. 4,812,277, Cl. 264-185.000.
Molex Incorporated: *See*—
Dambach, Philip J.; and Brown, Ray, 4,812,003, Cl. 350-96.180.
Molitor, Paul-Rainer, to Otto Dunkel GmbH, Fabrik fur Eletrotechnische Gerate. Electrical plug and socket connector. 4,812,136, Cl. 439-589.000.
Moll, Kenneth W. Method for producing molded circuit boards. 4,811,482, Cl. 29-848.000.
Monarch Marking Systems, Inc.: *See*—
Feltz, John F.; Taylor, John W.; and Vuketich, Richard S., 4,812,822, Cl. 340-572.000.
Monquin, Felix; and Condamin, Bernard, to Renault Vehicules Industriels. Differential locking device. 4,811,629, Cl. 74-710.500.
Montagna, Angelo A.: *See*—
Jacobson, Allan J.; Ho, Teh C.; Chianelli, Russell R.; Steger, John J.; and Montagna, Angelo A., 4,812,227, Cl. 208-215.000.
Montefiore Hospital Society of Western Pennsylvania, Inc., The: *See*—
Stanko, Ronald T., 4,812,479, Cl. 514-557.000.
Montoro, Fernando; Calatayud, Jose; and Luna, Manuel, to Especialidades Latinas Medicamentos Universales, S.A. (Elmu, S.A.). Application of α-[[(2-hydroxy-1, 1-dimethyl-ethyl) amine] methyl] benzene methanol hydrochloride (EL-508) as a drug with antiinflammatory action. 4,812,482, Cl. 514-649.000.
Moore, Patrick D.: *See*—
Baumgartner, Alan S.; Moore, Patrick D.; and VanDahm, Richard A., 4,812,141, Cl. 8-506.000.
Moore, Paul E., to Arcair Company. Adaptor for converting oxy-fuel cutting torches to exothermic cutting. 4,812,610, Cl. 219-70.000.
Moorhead, Arthur J.; Bomar, E. S.; and Becher, Paul F., to United States of America, Energy. Process for fabrication of large titanium diboride ceramic bodies. 4,812,280, Cl. 264-332.000.
Morach, Eugen: *See*—
Hoffmann, Karl-Ludwig; Eiden, Gunter; and Morach, Eugen, 4,812,267, Cl. 264-169.000.
Moreno, Ernie A.; and Moreno, Ray D. Tire rim protector for cleaning and applying a liquid protectant to tires. 4,811,991, Cl. 301-37.00R.
Moreno, Ray D.: *See*—
Moreno, Ernie A.; and Moreno, Ray D., 4,811,991, Cl. 301-37.00R.
Mori, Kenji: *See*—
Takeda, Masatoshi; Ikeda, Kazuo; Tominaga, Yoshiharu; and Mori, Kenji, 4,812,669, Cl. 307-105.000.
Mori, Makoto: *See*—
Hanazawa, Hideaki; Mori, Makoto; Saseki, Katsumi; and Inagaki, Katsumi, 4,812,327, Cl. 427-388.400.
Mori, Masakazu: *See*—
Yamane, Kazuo; Mori, Masakazu; Tsuda, Takashi; Ohkuma, Yoshinori; and Suzuki, Kazuhiro, 4,813,048, Cl. 372-38.000.
Morimoto, Kazuo: *See*—
Takahashi, Ryoichi; Sato, Tomoyoshi; Tsukamoto, Hidehiko; Morimoto, Kazuo; and Maeda, Nobutaka, 4,811,585, Cl. 72-108.000.
Morimoto, Masamichi: *See*—
Okada, Takao; and Morimoto, Masamichi, 4,813,016, Cl. 365-107.000.
Morimoto, Yoshinari: *See*—
Oishi, Minoru; Morimoto, Yoshinari; Furukawa, Akihiro; Miura, Tomoko; Ikeda, Yoshie; and Nagatsuna, Akemi, 4,812,832, Cl. 340-709.000.
Morimura, Kazuyuki: *See*—
Usami, Ikuzo; Sato, Yoshinori; Kurosawa, Yoshitaka; and Mcrimura, Kazuyuki, 4,811,549, Cl. 53-428.000.
Usami, Ikuzo; Sato, Yoshinori; Kurosawa, Yoshitaka; and Morimura, Kazuyuki, 4,811,838, Cl. 206-219.000.
Morishita, Mimpei; and Azukizawa, Teruo, to Kabushiki Kaisha Toshiba. Transportation system of a floated-carrier type. 4,811,667, Cl. 104-284.000.
Moriya, Koichi: *See*—
Shiokawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; Moriya, Koichi; and Baasner, Bernd, 4,812,454, Cl. 514-256.000.
Shiokawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; and Moriya, Koichi, 4,812,571, Cl. 546-296.000.
Morozumi, Manami: *See*—
Terada, Takashi; Aoki, Minoru; Ohtaki, Hiroshi; Morozumi, Manami; and Shiozaki, Mitsuharu, 4,812,560, Cl. 536-29.000.
Morrison, Roger A.: *See*—
Hickey, Karlton J., Jr.; and Morrison, Roger A., 4,812,223, Cl. 208-111.000.
Morrison, Shawn J., to Northern Telecom Limited. Method and apparatus for detecting a narrowband signal. 4,812,743, Cl. 324-77.00R.
Morse, Alfred W., to Westinghouse Electric Corp. Pulse amplifier. 4,812,686, Cl. 307-491.000.
Morse, Margaret S.: *See*—
Coe, Richard J.; and Morse, Margaret S., 4,812,855, Cl. 343-818.000.
Morton, John C., Jr., to Jodac, Inc. Plant hanger. 4,811,475, Cl. 29-521.000.
Mosele, Joseph: *See*—
Maier, Gunther; Mosele, Joseph; and Perkins, Roger, 4,811,478, Cl. 29-613.000.
Moses, Klaus; and Lange, Heinz, to Telenorma Telefonbau und Normalzeit GmbH. Switching device for power supply to additional accessories for a telephone. 4,813,072, Cl. 379-388.000.

Mosier, Arthur R., to Undersea Industries, Inc. Quick-disconnect apparatus for inflating a scuba diving buoyancy jacket. 4,812,083, Cl. 405-186.000.

Moss, Brian F.; and Brent, Richard J., to Ciba-Geigy AG. Apparatus for processing an exposed photographic film wound on a spool. 4,812,867, Cl. 354-313.000.

Moss, Brian F.: *See*—
Brent, Richard J.; and Moss, Brian F., 4,812,882, Cl. 355-77.000.

Motion Control Industries, Inc.: *See*—
Galati, Celeste C., 4,811,908, Cl. 241-21.000.

Motion Design Creations Inc.: *See*—
Stewart, Leo J., 4,811,674, Cl. 114-39.200.

Motorola: *See*—
Perry, Richard D., 4,812,677, Cl. 307-296.00R.

Motorola, Inc.: *See*—
Jung, Richard H.; and Logsdon, Philip R., 4,812,421, Cl. 437-211.000.
Mahabadi, John K., 4,812,679, Cl. 307-272.100.
Pfiester, James R.; Parrillo, Louis C.; and Dockrey, J. William, 4,812,418, Cl. 437-069.000.

Mouille, Rene L., to Aerospatiale Societe Nationale Industrielle. Main transmission gearbox for a twin-engined helicopter. 4,811,627, Cl. 74-665.00L.

Moulding, Thomas S., Jr.; and Ellis, Donald G. Dual layered card for permitting selective access to an object. 4,811,844, Cl. 206-459.000.

Moulton, Anthony D. Spring action fastener. 4,812,097, Cl. 411-347.000.

MP-Sejl A/S: *See*—
Pedersen, Mogens; Wiesel, Gunther; and Brenholdt, Niels, 4,811,677, Cl. 114-89.000.

MTM Molded Products Company: *See*—
Minneman, William J., 4,811,836, Cl. 206-3.000.

MTU Motoren-und Turbinen-Union Muenchen GmbH: *See*—
Adam, Peter; Sedlmair, Thomas; and Podlech, Manfred, 4,812,052, Cl. 374-50.000.

Madge, Paul R., to National Starch & Chemical Corp. Pressure sensitive adhesives comprising ethylene vinyl acetate dioctyl malcate terpolymers. 4,812,547, Cl. 526-301.000.

Muelbeck, Martin. Sheet of roofcovering material. 4,812,349, Cl. 428-138.000.

Mueller, Helmar A., to Harsco Corporation. Artillery training apparatus with recoil/countcrrecoil simulation. 4,812,122, Cl. 434-18.000.

Mueller, Raymond, Jr.; and Nelson, Richard, to Western Industries Inc. Cap and spout assembly for a can. 4,811,865, Cl. 222-153.000.

Muhlberger, Rupert: *See*—
Klam, Rudiger; Muhlberger, Rupert; and Stadler, Karl, 4,812,710, Cl. 313-579.000.

Mukaiya, Hitoshi, to Canon Kabushiki Kaisha. Zoom lens. 4,812,024, Cl. 350-427.000.

Muller, Bruce R.: *See*—
Carmichael, Even P.; Niedospial, John J.; Covington, Roger G.; and Muller, Bruce R., 4,813,063, Cl. 378-182.000.

Muller, Gunter: *See*—
Meyer, Rainer-Leo; John, Reinmar; Nagel, Rolf; and Muller, Gunter, 4,812,356, Cl. 428-220.000.

Muller, Hans, to Heidelberger Druckmaschinen Aktiengesellschaft. Apparatus for cutting and dividing a continuous stream of printed products. 4,811,641, Cl. 83-105.000.

Muller, Hans-Rudolf, to Zuricher Beuteltuchfabrik AG. Object for receiving and storing useful means. 4,811,693, Cl. 119-15.000.

Mullin, John B.; Hamilton, John C.; Orrell, Elisabeth D.; Jacobs, Philip R.; and Shenai-Khatkhate, Deodattta V., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Preparation of Group II metal alkyls. 4,812,586, Cl. 556-129.000.

Mundus, Friedhelm; and Voss, Hans-Ludwig, to Windmoller & Holscher. Apparatus for moving a carriage or the like. 4,811,879, Cl. 226-136.000.

Munkel, Albert: *See*—
Eckes, Helmut; Winter, Rainer; and Munkel, Albert, 4,812,492, Cl. 523-351.000.

Munzel, Martin: *See*—
Friemel, Wolfgang; Barth, Volker; Munzel, Martin; and Ehret, Reiner, 4,812,291, Cl. 422-28.000.

Murai, Maasumi, to Tsubakimoto Chain Co. Carriage-type conveyor. 4,811,685, Cl. 118-326.000.

Murakami, Tomoyoshi: *See*—
Matsuo, Shigeru; Murakami, Tomoyoshi; Bando, Thoru; and Nagatoshi, Kikuo, 4,812,507, Cl. 524-611.000.

Muramoto, Hisaichi; Ishii, Keizou; and Miyazono, Tadafumi, to Nippon Paint Co., Ltd. Resinous composition comprising an acrylic resin having end carboxyl bearing long pendant groups and preparation thereof. 4,812,549, Cl. 526-318.000.

Murao, Kazuhiko: *See*—
Murao, Masatsugu; Murao, Kazuhiko; and Mochizuki, Tsuyoshi, 4,811,748, Cl. 134-122.00R.

Murao, Masatsugu; Murao, Kazuhiko; and Mochizuki, Tsuyoshi, to Naniwa Seitei Kabushiki Kaisha. Method and apparatus for continuously applying surface treatment onto an article being fed along a pass line. 4,811,748, Cl. 134-122.00R.

Murata, Mitsuo: *See*—
Watanabe, Yoshiaki; Yokoo, Chihiro; Goi, Masami; Onodera, Akira; Murata, Mitsuo; Fukushima, Hiroshi; and Sota, Kaoru, 4,812,562, Cl. 540-227.000.

Murata, Takahiko: *See*—
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Murata, Yasushi; and Yanagisawa, Shuich, to Pioneer Electronic Corporation. Optical information record disk. 4,812,857, Cl. 346-137.000.

Murphy, James C., to Nordson Corporation. Electrostatic powder spray gun with adjustable deflector and electrostatic shield. 4,811,898, Cl. 239-3.000.

Murray, Michael A., to Ethicon, Inc. Staple positioning tab. 4,811,886, Cl. 227-19.000.

Murray, Richard A., to Enter Computer, Inc. Indexing mechanism. 4,812,858, Cl. 346-139.00R.

Musholm Lax A/S: *See*—
Malmbak-Kjeldsen, Kurt, 4,811,692, Cl. 119-3.000.

Muther, Manfred: *See*—
Heubeck, Erich; Gunther, Werner; Muther, Manfred; and Werner, Leonhard, 4,813,060, Cl. 378-39.000.

Muyskens, David B., to White Consolidated Industries, Inc. Appliance shipping container with integral corner posts. 4,811,840, Cl. 206-320.000.

Myers, Clyde J.: *See*—
Carlisle, Arthur W.; Darden, Bruce V.; and Myers, Clyde J., 4,812,009, Cl. 350-96.210.

NAB-Konsult: *See*—
Granstrom, Staffan, 4,812,117, Cl. 432-9.000.

Nabata, Toshinari, to KOEI Chemical Co., Ltd. Process for preparing 1-dodecylazacycloheptane-2-one. 4,812,566, Cl. 540-533.000.

Nadeau, Francois; and Braeuel, Michael T., to Canadian Patents and Development Limited/Societe Canadienne des Brevets et D'Exploitation Limitee. Apparatus and method for inspecting the degradation of a gas nozzle. 4,811,605, Cl. 73-645.000.

Nagano, Chikara: *See*—
Shimada, Yoshihiro; Fujihara, Tadafumi; Nagano, Chikara; and Tsukamoto, Katsuo, 4,812,039, Cl. 356-129.000.

Nagasaki, Hideo; Yachigo, Shinichi; Ishii, Tamaki; Yoshimura, Masakatsu; Takahashi, Yukoh; and Yamamoto, Hiroki, to Sumitomo Chemical Company, Limited. Stabilized styrene polymer. 4,812,494, Cl. 524-91.000.

Nagasawa, Kenichi: *See*—
Nagashima, Yoshitake; Ishikawa, Hisashi; Kozuki, Susumu; Yoshimura, Katsuji; Takahashi, Koji; and Nagasawa, Kenichi, 4,812,920, Cl. 358-310.000.

Nagase, Masakatsu: *See*—
Yokoyama, Shigeki; Kamiya, Takeshi; Niikawa, Takeo; Nagase, Masakatsu; and Kuroishi, Tetujiro, 4,812,355, Cl. 428-215.000.

Nagashima, Yoshitake; Ishikawa, Hisashi; Kozuki, Susumu; Yoshimura, Katsuji; Takahashi, Koji; and Nagasawa, Kenichi, to Canon Kabushiki Kaisha. Wide band video signal recording apparatus. 4,812,920, Cl. 358-310.000.

Nagata, Shizuo: *See*—
Tanoshima, Katsuhide; Suzuki, Yasuhiro; Nagata, Shizuo; and Shimizu, Yasuo, 4,813,007, Cl. 346-74.500.

Nagata, Tomihiko: *See*—
Yamada, Motokazu; Hayakawa, Hideyuki; Fukui, Tomonori; Matsuhashi, Hajime; Kaneko, Yasuhiro; Ikeda, Motozo; and Nagata, Tomihiko, 4,812,845, Cl. 340-995.000.

Nagata, Yukiaki, to Kabushiki Kaisha Sugino Machine. Superhigh pressure fluid injection apparatus. 4,811,902, Cl. 239-240.000.

Nagatoshi, Kikuo: *See*—
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Nagatsuna, Akemi: *See*—
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Nagayama, Susumu: *See*—
Yamazaki, Shunpei; Suzuki, Kunio; Kinka, Mikio; Fukada, Takeshi; Abe, Masayoshi; Kobayashi, Ippei; Shibata, Katsuhiko; Susukida, Masato; Nagayama, Susumu; and Koyanagi, Kaoru, 4,812,415, Cl. 437-2.000.

Nagel, Rolf: *See*—
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Nagura, Osamu: *See*—
Nakagawa, Hiroto; Oono, Yasuteru; Kato, Tadaatsu; Nagura, Osamu; Niwa, Sadahiko; Furukawa, Yosio; and Kayukawa, Shigehiro, 4,812,730, Cl. 318-732.000.

Naito, Masahito: *See*—
Okochi, Kastuhiko; Toya, Mitsuo; Naito, Masahito; Inoue, Yoshiaki; and Egusa, Takahiro, 4,812,997, Cl. 364-505.000.

Najm, Elie M.: *See*—
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Nakadai, Katsuo: *See*—
Minoura, Nobuo; and Nakadai, Katsuo, 4,812,922, Cl. 360-10.100.

Nakae, Yoshio; Kinoshita, Akiyo; and Tanaka, Koichi, to Kabushiki Kaisha Nisshin Seisakusho. Truing device for hones. 4,811,521, Cl. 51-5.00D.

Nakagawa, Hiroaki; Kondo, Masahiro; and Ohishi, Noriake, to Mitsui Petrochemical Industries, Ltd. Process for preparation of cellulose ester films. 4,812,279, Cl. 264-311.000.

Nakagawa, Hiroto; Oono, Yasuteru; Kato, Tadaatsu; Nagura, Osamu; Niwa, Sadahiko; Furukawa, Yosio; and Kayukawa, Shigehiro, to Hitachi, Ltd.; and Kansai Electric Power Co., Inc. Variable-speed generator/motor system. 4,812,730, Cl. 318-732.000.

Nakagawa, Hiroto: *See*—
Ito, Akio; Sawa, Hidenori; Sugisaka, Hiroshi; Hayashi, Shigeaki; Nakagawa, Hiroto; Oono, Yasuteru; and Haraguchi, Eiji, 4,812,729, Cl. 318-732.000.
Nakagawa, Katsuhiro, to Hitachi, Ltd. Control in mass analyzer. 4,812,649, Cl. 250-296.000.
Nakagawa, Koji: *See*—
Hiramatsu, Toshiyuki; Azuma, Shizuo; Nakagawa, Koji; and Ichikawa, Yataro, 4,812,163, Cl. 71-92.000.
Nakagawa, Norio: *See*—
Takagi, Katsuaki; Aoki, Hirokazu; Nakagawa, Norio; and Hagiwara, Yoshimune, 4,812,969, Cl. 364-200.000.
Nakagawa, Yukio: *See*—
Honjo, Masahiro; Takeuchi, Akihiro; Ochi, Atsuo; Aki, Shinichi; Nakagawa, Yukio; and Kobayashi, Masaaki, 4,812,783, Cl. 331-20.000.
Nakahama, Ryoji, to Sanshin Kogyo Kabushiki Kaisha. Device driving injection pump for fuel-injection engine. 4,811,717, Cl. 123-509.000.
Nakahara, Motohiro: *See*—
Kyoto, Michihisa; Yoshioka, Naoki; Tanaka, Gotaro; Kanamori, Hiroo; Watanabe, Minoru; and Nakahara, Motohiro, 4,812,155, Cl. 65-3.120.
Nakahara, Yutaka; Nishimura, Atsushi; and Nakajima, Toshio, to Adeka Argus Chemical Co., Ltd. Polycarbonate resin compositions having improved resistance to deterioration when exposed to light and containing alkylidene bis(benzotriazolyl phenols). 4,812,498, Cl. 524-91.000.
Nakajima, Toshio: *See*—
Nakahara, Yutaka; Nishimura, Atsushi; and Nakajima, Toshio, 4,812,498, Cl. 524-91.000.
Nakamura, Akira: *See*—
Hasegawa, Hiroaki; Miyata, Yasuji; Sugimoto, Koyata; and Nakamura, Akira, 4,811,606, Cl. 73-861.380.
Nakamura, Hironori: *See*—
Shimogawara, Jun; and Nakamura, Hironori, 4,812,065, Cl. 400-624.000.
Nakamura, Shuichi, to Tokico Ltd. Magnetic disc recording and reproducing device. 4,812,933, Cl. 360-105.000.
Nakamura, Tadahiko: *See*—
Kakinuma, Koichiro; Ando, Makoto; Sawa, Masahiko; Ohmuro, Hideaki; Ohryo, Akira; and Nakamura, Tadahiko, 4,812,632, Cl. 235-479.000.
Nakamura, Takeshi: *See*—
Yamaoka, Naoji; Ozawa, Shogo; Fukai, Naoki; Yuzawa, Masayuki; Nakamura, Takeshi; and Asano, Yutaka, 4,811,891, Cl. 228-182.000.
Nakamura, Tohru; Nakazato, Kazuo; Homma, Noriyuki; Sagara, Kazuhiko; Shiba, Takeo; Kure, Tokuo; and Hayashida, Tetsuya, to Hitachi, Ltd. Semiconductor device. 4,812,894, Cl. 357-55.000.
Nakano, Osamu: *See*—
Tashiro, Syuzaburou; Ina, Toshikazu; Nakano, Osamu; Taguchi, Masahiro; Onimaru, Sadahisa; and Kuno, Akira, 4,812,838, Cl. 340-825.060.
Nakano, Yasushi: *See*—
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Nakaosa, Yoshitake: *See*—
Adachi, Shigemi; Nakaosa, Yoshitake; and Fujioka, Yoshiki, 4,812,975, Cl. 364-300.000.
Nakase, Ryoichi; and Nanami, Masayoshi, to Sanshin Kogyo Kabushiki Kaisha. Exhaust system for marine propulsion. 4,811,560, Cl. 60-310.000.
Nakata, Nobuhiro: *See*—
Honda, Noriyuki; Abe, Yukio; Isobe, Makoto; and Nakata, Nobuhiro, 4,811,496, Cl. 34-144.000.
Nakata, Yasuo: *See*—
Ogata, Nobuo; Nakata, Yasuo; Satou, Hideaki; Tanaka, Toshiyuki; Minami, Etsuji; Yoshida, Yoshio; Kurata, Yukio; and Inoue, Teruaki, deceased, 4,812,638, Cl. 250-201.000.
Nakatani, Seiichi: *See*—
Yuhaku, Satoru; Nakatani, Seiichi; Nishimura, Tsutomu; and Ishida, Toru, 4,812,422, Cl. 501-20.000.
Nakaya, Mitsuyoshi: *See*—
Miyakoshi, Kazumitsu; and Nakaya, Mitsuyoshi, 4,812,815, Cl. 455-612.000.
Nakayama, Mitsuo: *See*—
Masuzawa, Isao; Miyayama, Toshio; Nakayama, Mitsuo; and Nishimura, Koichi, 4,811,679, Cl. 114-144.0RE.
Nakayama, Takeshi: *See*—
Kobayashi, Kazuo; Terada, Yasushi; and Nakayama, Takeshi, 4,813,018, Cl. 365-185.000.
Nakayama, Yoshinori; and Takizawa, Kikuo, to Sanyo Electric Co., Ltd. Nickel-chromium stainless steel having improved corrosion resistances and machinability. 4,812,287, Cl. 420-41.000.
Nakazaki, Youji: *See*—
Sato, Yoshitake; Ohike, Toshio; and Nakazaki, Youji, 4,812,749, Cl. 324-106.000.
Nakazato, Kazuo: *See*—
Nakamura, Tohru; Nakazato, Kazuo; Homma, Noriyuki; Sagara, Kazuhiko; Shiba, Takeo; Kure, Tokuo; and Hayashida, Tetsuya, 4,812,894, Cl. 357-55.000.
Nakazawa, Hayashi; Iyoda, Hiroumi; and Ueta, Makoto, to Hitachi Ltd .; and Hitachi Elevator Engineering Co. Frame of passenger conveyor. 4,811,829, Cl. 198-326.000.
Nambu Electric Co., Ltd.: *See*—
Nambu, Yukio, 4,811,551, Cl. 53-500.000.
Nambu, Yukio, to Nambu Electric Co., Ltd. Packaging apparatus for packaging eggs, etc. 4,811,551, Cl. 53-500.000.
Nambudiry, Mayara E. N., to Lever Brothers Company. Detergent composition. 4,812,252, Cl. 252-108.000.
Nanami, Masayoshi: *See*—
Nakase, Ryoichi; and Nanami, Masayoshi, 4,811,560, Cl. 60-310.000.
Naniwa Seitei Kabushiki Kaisha: *See*—
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Nara, Takashi: *See*—
Okada, Sumie; Nara, Takashi; Hatano, Takashi; Kawato, Yutaka; Shimozono, Ryoji; Tsutsumi, Kenji; Ogawa, Yasunori; and Tanaka, Yasuo, 4,812,839, Cl. 340-825.140.
Narita, Ryoichi; Sonobe, Toshio; Ito, Hitoshi; Ishikawa, Junji; Takenaka, Osamu; and Sugiura, Junji, to Nippondenso Co., Ltd. Semiconductor element sealing structure. 4,812,897, Cl. 357-72.000.
Narumiya, Shuh; Hayaishi, Osamu; Kimura, Yoshiharu; and Tsuboshima, Masami, to Research Development Corporation; and Tsuboshima, Masami. Prostagiandin derivatives. 4,812,457, Cl. 514-226.200.
Nash, John; and Michels, Mark, to Kensey Nash Corporation. Stone destroying catheter and method of use. 4,811,735, Cl. 128-305.000.
Natale, Thomas, to GPAC, Inc. Portable containment device for treatment of hazardous materials. 4,812,700, Cl. 312-1.000.
National Exchange, Inc.: *See*—
Whitehead, Clay T., 4,813,036, Cl. 370-57.000.
National Gypsum Company: *See*—
Menchetti, Robert J., 4,811,539, Cl. 52-486.000.
National Starch and Chemical Corporation: *See*—
Eden, James; Trksak, Ralph; and Williams, Robert, 4,812,445, Cl. 514-60.000.
Hanazawa, Hideaki; Mori, Makoto; Sasaki, Katsumi; and Inagaki, Katsumi, 4,812,327, Cl. 427-388.400.
Mudge, Paul R., 4,812,547, Cl. 526-301.000.
Natori, Tatsuo; Hioki, Susumu; Shimaguchi, Takashi; Yamada, Toshihiro; Watanabe, Akihide; and Kanekatsu, Kensuke, to Hitachi, Ltd. Process for repairing mold. 4,812,278, Cl. 264-221.000.
Nauchno-Proizvodstvennoe Obiedinenie Po Mekhanizirovannomu Stroitelnomu Instrumentru I Otdelochnym Mashinam: *See*—
Antipov, Georgy A.; Gelfand, Mikhail L.; Goldshtein, Boris G.; Korniliev, Gennady A.; Lavnikov, Nikolai S.; Tsipenjuk, Yakov I.; and Yakubovsky, Petr S., 4,811,797, Cl. 173-93.600.
Navratil, Martin; Baytycky, Jimmy P.; Sovak, Mojmir; and Mitchell, Mark, to Borden Company Limited. Method for reducing the permeability of underground strata during secondary recovery of oil. 4,811,787, Cl. 166-273.000.
Nawata, Yoshiaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Motor control device for a copying machine. 4,812,876, Cl. 355-14.00R.
Nazarathy, Moshe; Newton, Steven A.; and Foster, Scott H., to Hewlett-Packard Company. Adaptive selection of OTDR test parameters and the fusion of data taken from successively shrinking measurement spans. 4,812,038, Cl. 356-73.100.
NCR Corporation: *See*—
Girard, Donald J., 4,812,840, Cl. 340-825.500.
Lyons, Dale R.; Lawter, Raymond L.; and Beam, Don E., 4,811,579, Cl. 70-85.000.
NEC Corporation: *See*—
Ide, Motoki; and Sato, Toshifumi, 4,812,813, Cl. 340-311.100.
Ohara, Sinji, 4,812,999, Cl. 364-518.000.
Oyamada, Takashi, 4,812,950, Cl. 361-395.000.
Shimogawara, Jun; and Nakamura, Hironori, 4,812,065, Cl. 400-624.000.
Sumihiro, Naotaka, 4,812,898, Cl. 357-23.500.
NECCHI Societa per Azioni: *See*—
Sola, Giuseppe, 4,811,782, Cl. 164-495.000.
Negev, Michael, to Elta Electronics Industry Limited. Microstrip antenna. 4,812,853, Cl. 343-700.0MS.
Nehring, Jurgen: *See*—
Kaufmann, Meinolph; Kloti, Karl; Nehring, Jurgen; and Schad, Hanspeter, 4,812,635, Cl. 250-231.00R.
Nelson, Lawrence L., to Hercules Incorporated. Process for production of mineral dispersions. 4,812,260, Cl. 252-378.00R.
Nelson, Richard: *See*—
Mueller, Raymond, Jr.; and Nelson, Richard, 4,811,865, Cl. 222-153.000.
Nelson, Stephen J., to Upjohn Company, The. Process for preparing aldol intermediates. 4,812,582, Cl. 549-214.000.
Nelson, Terry M.: *See*—
Chan, C. S.; Hanson, Gary E.; and Nelson, Terry M., 4,812,859, Cl. 346-140.00R.
Nemoto, Tsuneo; and Kaneko, Mika, to Sony Corporation. Magnetic disk cartridge with improved center plate for disk mounting. 4,812,937, Cl. 360-133.000.
Neuerburg, Horst: *See*—
Ermscora, Rino; and Neuerburg, Horst, 4,811,553, Cl. 56-13.600.
Neumann, Ulrich; and Wölfl, Volkmar, to Inoex GmbH Innovationen und Austrustungen Fur Die Extrusionstechnik. Material feed device for an extruder. 4,812,048, Cl. 366-141.000.
New England Machinery, Inc.: *See*—
Bankuty, Geza E.; Byron, LeRoy F.; and Cianciullo, Joseph J., 4,811,850, Cl. 209-546.000.
Newell, Robert E.; Rand, Paul K.; and Fitzsimmons, Robert A., to Glaxo Group Limited. Devices for administering medicaments to patients. 4,811,731, Cl. 128-203.150.

Newline Electronic AB: *See*—
Ask, Willy G.; and Wahlberg, E. Peter M., 4,812,953, Cl. 362-103.000.
Newsome, R. Wayne. Chimney facade system. 4,811,534, Cl. 52-219.000.
Newton, Steven A.: *See*—
Nazarathy, Moshe; Newton, Steven A.; and Foster, Scott H., 4,812,038, Cl. 356-73.100.
Ney, Hermann, to U.S. Philips Corporation. Method for determining the variation with time of a speech parameter and arrangement for carryin out the method. 4,813,075, Cl. 381-43.000.
Niedermeier, Johann: *See*—
Brehm, Gerhard; and Niedermeier, Johann, 4,811,722, Cl. 125-11.00R.
Niederst, Ken W.: *See*—
Karabin, Richard F.; Niederst, Ken W.; Sandala, Michael G.; and Coleridge, Edward R., 4,812,215, Cl. 204-181.700.
Niedospial, John J.: *See*—
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Nielsen, Eva K.: *See*—
Nielsen, Hans B.; and Nielsen, Eva K., 4,811,917, Cl. 242-118.100.
Nielsen, Flemming E.: *See*—
Honore, Tage; Drejer, Jorgen; Jacobsen, Poul; and Nielsen, Flemming E., 4,812,458, Cl. 514-249.000.
Nielsen, Hans B.; and Nielsen, Eva K. Tube for yarn bobbins. 4,811,917, Cl. 242-118.100.
Niemann, Gary O. Apparatus for obtaining a random sample. 4,811,832, Cl. 198-443.000.
Niemi, Jouko; Pyoria, Kaarlo; and Korhonen, Heikki, to OY Finnpulva AB; and Kemira OY. Method and apparatus for improving the grinding result of a pressure chamber grinder. 4,811,907, Cl. 241-5.000.
Nierat, Jeanine: *See*—
Buendia, Jean; and Nierat, Jeanine, 4,812,512, Cl. 525-54.110.
Niese, Virgil J.: *See*—
Foster, L. Dale; and Niese, Virgil J., 4,811,435, Cl. 5-60.000.
Nihon Biso Kabushiki Kaisha: *See*—
Sugiyama, Yutaka, 4,811,819, Cl. 182-37.000.
Nihon Tokushu Noyaku Seizo K.K.: *See*—
Shiokawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; Moriya, Koichi; and Bazsner, Bernd, 4,812,454, Cl. 514-256.000.
Shiokawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; and Moriya, Koichi, 4,812,571, Cl. 546-296.000.
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Yokoyama, Shigeki; Kamiya, Takeshi; Niikawa, Takeo; Nagase, Masakatsu; and Kuroishi, Tetujiro, 4,812,355, Cl. 428-215.000.
Nikon Corporation: *See*—
Kodama, Hiroyuki; Mangyo, Katsumi; and Ichimura, Takeo, 4,812,423, Cl. 501-55.000.
Kusaka, Yosuke; and Utagawa, Ken, 4,812,636, Cl. 250-201.000.
Matsumoto, Kohichi, 4,812,028, Cl. 350-444.000.
Ogawa, Hidehiro; and Kazami, Kazuyuki, 4,812,699, Cl. 310-316.000.
Utagawa, Ken; and Hamanishi, Yoshinari, 4,812,868, Cl. 354-402.000.
Yanagisawa, Masaaki, 4,812,027, Cl. 350-463.000.
Nilsson, Tomas, to Bio-Instructa Labkonsult. Method of determining hypersensitivity to an allergen. 4,812,402, Cl. 435-29.000.
Ninomiya, Takao: *See*—
Oi, Fumio; Osaki, Haruyoshi; Furuta, Akihiro; Uemura, Yukikazu; Ninomiya, Takao; Uetani, Yasunori; and Hanabata, Makoto, 4,812,551, Cl. 528-129.000.
Nippon Air Brake Co., Ltd.: *See*—
Hata, Yasuhisa; and Akamatsu, Osamu, 4,811,651, Cl. 92-29.000.
Hata, Yasuhisa; and Kitaue, Masaaki, 4,812,148, Cl. 55-162.000.
Nippon Elanco Kabushiki Kaisha: *See*—
Yamamoto, Taizo; Konishi, Hirokazu; Kawaguchi, Yoshihisa; and Ohnishi, Yoshizumi, 4,811,802, Cl. 177-1.000.
Nippon Ferrite, Ltd.: *See*—
Kuramoto, Kenji; and Yumoto, Manabu, 4,812,787, Cl. 333-1.100.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Nishi, Kazuhiko; Ishii, Takatoshi; Yamashita, Ryozo; Yamaoka, Shigemitsu; and Okumura, Takatoshi, 4,812,828, Cl. 340-706.000.
Nippon Gear Co., Ltd.: *See*—
Takayama, Sui, 4,811,618, Cl. 74-89.150.
Nippon Kayaku Kabushiki Kaisha: *See*—
Terada, Takashi; Aoki, Minoru; Ohtaki, Hiroshi; Morozumi, Manami; and Shiozaki, Mitsuharu, 4,812,560, Cl. 536-29.000.
Nippon Oil Co., Ltd.: *See*—
Shinzawa, Akira; and Kohno, Yoshiki, 4,812,262, Cl. 252-567.000.
Nippon Oil and Fats Co., Ltd.: *See*—
Okamoto, Shingo; Kiryu, Masao; and Yoshida, Atsushi, 4,812,336, Cl. 427-257.000.
Nippon Paint Co., Ltd.: *See*—
Kuwajima, Teruaki; Uenoyama, Kazuo; Takae, Masaki; and Okuda, Hidefumi, 4,812,335, Cl. 427-407.100.
Muramoto, Hisaichi; Ishii, Keizou; and Miyazono, Tadafumi, 4,812,549, Cl. 526-318.000.
Nippon Petrochemicals Co., Ltd.: *See*—
Yokoyama, Shigeki; Kamiya, Takeshi; Niikawa, Takeo; Nagase, Masakatsu; and Kuroishi, Tetujiro, 4,812,355, Cl. 428-215.000.
Nippon Soda Co., Ltd.: *See*—
Hagiwara, Kenji; Ishikawa, Hisao; Hosaka, Hideo; and Inaba, Hideo, 4,812,161, Cl. 71-90.000.
Nippon Soken, Inc.: *See*—
Tashiro, Syuzaburou; Ina, Toshikazu; Nakano, Osamu; Taguchi, Masahiro; Onimaru, Sadahisa; and Kuno, Akira, 4,812,838, Cl. 340-825.060.
Nippon Steel Corporation: *See*—
Saiki, Goro; Kondo, Jiro; Takeda, Koichi; Maki, Mutsuo; and Ooki, Tutomu, 4,812,166, Cl. 75-0.50C.
Shindou, Yoshio; and Kabeya, Motoo, 4,812,371, Cl. 428-659.000.
Nippon Telegraph & Telephone Public Corporation: *See*—
Kyoto, Michihisa; Yoshioka, Naoki; Tanaka, Gotaro; Kanamori, Hiroo; Watanabe, Minoru; and Nakahara, Motohiro, 4,812,155, Cl. 65-3.120.
Nippondenso Co., Ltd.: *See*—
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Narita, Ryoichi; Sonobe, Toshio; Ito, Hitoshi; Ishikawa, Junji; Takenaka, Osamu; and Sugiura, Junji, 4,812,897, Cl. 357-72.000.
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Yamada, Motokazu; Hayakawa, Hideyuki; Fukui, Tomonori; Matsuhashi, Hajime; Kaneko, Yasuhiro; Ikeda, Motozo; and Nagata, Tomihiko, 4,812,845, Cl. 340-995.000.
Yamada, Takeshi; Fujimoto, Hidetoshi; Ito, Kenzo; and Hanabusa, Kazunori, 4,812,980, Cl. 364-449.000.
Nir, Zohar: *See*—
Vogl, Otto; and Nir, Zohar, 4,812,575, Cl. 548-260.000.
Nishi, Kazubiko; Ishii, Takatoshi; Yamashita, Ryozo; Yamaoka, Shigemitsu; and Okumura, Takatoshi, to ASCII Corporation; and Nippon Gakki Seizo Kabushiki Kaisha. Video display processor. 4,812,828, Cl. 340-706.000.
Nishi, Masatsugu: *See*—
Tsumaki, Koji; Miyata, Kenji; and Nishi, Masatsugu, 4,812,774, Cl. 328-233.000.
Nishi, Naoichi, to Nishi Seisakusho Co., Ltd. Edge trimmer guide for sewing machine. 4,811,672, Cl. 112-128.000.
Nishi, Osamu: *See*—
Tokumaru, Yuzo; and Nishi, Osamu, 4,812,008, Cl. 350-96.210.
Nishi Seisakusho Co., Ltd.: *See*—
Nishi, Naoichi, 4,811,672, Cl. 112-128.000.
Nishi, Yoshinori: *See*—
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Nishi, Yoshio: *See*—
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Nishibe, Yuji; Nonomura, Yutaka; and Takeuchi, Masaharu, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Torque detecting apparatus. 4,811,609, Cl. 73-862.360.
Nishida, Hiroshi: *See*—
Suzuki, Masami; Nishida, Hiroshi; Suzuki, Tomio; Kawamura, Katsumi; and Takahashi, Tsuyoshi, 4,812,934, Cl. 360-106.000.
Nishida, Jun: *See*—
Miyama, Hiroshi; Kawauchi, Yoshikazu; Tomii, Kaoru; and Nishida, Jun, 4,812,716, Cl. 315-366.000.
Nishimori, Kadotaro; Ito, Masazumi; and Oyabu, Masaaki, to Minolta Camera Kubushiki Kaisha. Copying apparatus with multiple copy modes. 4,812,877, Cl. 355-14.00R.
Nishimura, Atsushi: *See*—
Nakahara, Yutaka; Nishimura, Atsushi; and Nakajima, Toshio, 4,812,498, Cl. 524-91.000.
Nishimura, Koichi: *See*—
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Nishimura, Tetsunhiko: *See*—
Chida, Yukio; Nishimura, Tetsunhiko; and Oguri, Yasuo, 4,812,698, Cl. 310-330.000.
Nishimura, Tsutomu: *See*—
Yuhaku, Satoru; Nakatani, Seiichi; Nishimura, Tsutomu; and Ishida, Toru, 4,812,422, Cl. 501-20.000.
Nishino, Takaichi: *See*—
Fujita, Yasuyuki; and Nishino, Takaichi, 4,811,925, Cl. 248-430.000.
Nishitani, Kunihiko: *See*—
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Nishitani, Noriaki: *See*—
Koba, Keiichiro; Utsunomiya, Taizo; Saitow, Yoshiaki; Iwanaga, Katsusuke; Matsue, Michihiko; and Nishitani, Noriaki, 4,812,271, Cl. 264-63.000.
Nishiumi, Kenichi; and Watanabe, Hideomi, to Kayaba Kogyo Kabushiki Kaisha. Joy stick. 4,812,802, Cl. 338-128.000.
Nishizawa, Hisao, to Dainippon Screen Mfg. Co., Ltd. Apparatus for washing opposite surfaces of a substrate. 4,811,443, Cl. 15-97.100.
Nissan Motor Co., Ltd.: *See*—
Takahashi, Ryoichi; Sato, Tomoyoshi; Tsukamoto, Hidehiko; Morimoto, Kazuo; and Maeda, Nobutaka, 4,811,585, Cl. 72-108.000.
Tamura, Kimichi; Kawada, Susumu; Sekine, Yoshitada; Abe, Kazuyoshi; Ishikawa, Ryosuke; and Yokota, Fumiki, 4,811,935, Cl. 269-34.000.
Nisshin Steel Co., Ltd.: *See*—
Tanaka, Teruo; Miyakusu, Katsuhisa; and Fujimoto, Hiroshi, 4,812,176, Cl. 148-12.0EA.
Yamauchi, Takashi; Hasegawa, Morihiro; and Akiyama, Ryuichi, 4,811,780, Cl. 164-428.000.
Nisshoku Corporation: *See*—
Shibata, Masashi; Hayakawa, Iwao; and Hayashibara, Tokimasa, 4,812,339, Cl. 428-15.000.

Nitta, Tomio, to Tokai Corporation. Valve for aerosol container to dispense a given amount of aerosol. 4,811,868, Cl. 222-462.200.
Nitto Boseki Co., Ltd.: *See*—
Kageno, Kenji; Ueda, Toshio; and Harada, Susumu, 4,812,540, Cl. 526-218.100.
Nitto Chemical Industry Co., Ltd.: *See*—
Doi, Shunichi; and Takayanagi, Yasuyuki, 4,812,579, Cl. 548-548.000.
Niwa, Sadahiko: *See*—
Nakagawa, Hiroto; Oono, Yasuteru; Kato, Tadaatsu; Nagura, Osamu; Niwa, Sadahiko; Furukawa, Yosio; and Kayukawa, Shigehiro, 4,812,730, Cl. 318-732.000.
Niwa, Takashi: *See*—
Sakamoto, Kazuho; Shitaya, Takao; Kusunoki, Shigeru; Maehara, Naoyoshi; Niwa, Takashi; Matsumoto, Takahiro; and Bessyo, Daisuke, 4,812,960, Cl. 363-20.000.
Nix, Lawrence A., Jr., to United States of America, Air Force. Resolution delta gun color monitor system apparatus. 4,812,718, Cl. 315-382.000.
Noble, Peter J. W.; and Maskens, Geoffrey D., to Ambotech Limited. Component supply apparatus. 4,811,480, Cl. 29-809.000.
Nocek, Robert S.: *See*—
Ausnit, Steven; and Nocek, Robert S., 4,812,074, Cl. 493-213.000.
Noji, Akio: *See*—
Kakuta, Yonehiro; Takigawa, Kouichi; Noji, Akio; Kuwabara, Shigeaki; Shimada, Tadashi; and Iida, Michihiro, 4,811,492, Cl. 33-366.000.
Nojiri, Naohiro; Sakai, Yukio; and Iwakura, Tomoatsu, to Mitsubishi Petrochemical Co., Ltd. Silver-deposited catalyst for production of ethylene oxide. 4,812,437, Cl. 502-243.000.
Nomura, Ituro: *See*—
Kubo, Kazuo; Tsuboi, Noboru; Nishitani, Kunihiko; and Nomura, Ituro, 4,812,110, Cl. 418-1.000.
Nomura, Toyokazu: *See*—
Suzuki, Tameyuki; Yasukawa, Junichi; Nomura, Toyokazu; Toda, Kazuo; Kamakura, Takuro; and Ota, Toshiaki, 4,812,387, Cl. 430-311.000.
Nonomura, Yutaka: *See*—
Nishibe, Yuji; Nonomura, Yutaka; and Takeuchi, Masaharu, 4,811,609, Cl. 73-862.360.
Nordischer Maschinenbau Rud. Badder GmbH & Co. Kg: *See*—
Behnk, Gunter; and Nuske, Dieter, 4,811,461, Cl. 17-56.000.
Nordson Corporation: *See*—
Murphy, James C., 4,811,898, Cl. 239-3.000.
Noro, Masao, to Yamaha Corporation. Dither circuit using dither including signal component having frequency half of sampling frequency. 4,812,846, Cl. 341-131.000.
North American Philips Corporation: *See*—
Carleton, Samuel A., 4,812,611, Cl. 219-74.000.
Katz, George, 4,811,958, Cl. 277-12.000.
Northern Telecom Limited: *See*—
Cowan, Michael L.; and Goodman, David C., 4,812,672, Cl. 307-64.000.
Kupferschmidt, Albert; Greene, Trace D.; and Jaycox, Donald F., 4,812,942, Cl. 361-119.000.
Lukas, Helmut H., 4,812,007, Cl. 350-96.210.
Morrison, Shawn J., 4,812,743, Cl. 324-77.00R.
Norton, Gary E.: *See*—
Mauck, John C.; Mauck, Linda A.; and Norton, Gary E., 4,812,399, Cl. 435-18.000.
Norton, Robert J. G.: *See*—
Epstein, Alan H.; Guenette, Gerald R.; and Norton, Robert J. G., 4,812,050, Cl. 374-1.000.
Nothdurft, Heinz: *See*—
Braun, Wolfgang; Emsmann, Wulf; Konrath, Karl; Krieger, Klaus; and Nothdurft, Heinz, 4,811,709, Cl. 123-357.000.
Nott, Sepideh H.: *See*—
Cobb, Carleton M., III; Hirsbrunner, Hans G.; Gonsalves, Edward M.; Jenne, Richard L.; and Nott, Sepideh H., 4,812,799, Cl. 337-70.000.
Numa, Nobushige: *See*—
Sugimura, You; Numa, Nobushige; Watanabe, Tadashi; Sugiyama, Yutaka; Ohira, Kazuhiko; and Yamaguchi, Sachio, 4,812,337, Cl. 427-407.100.
Nusinov, Eugene: *See*—
Joyce, Thomas F.; Nusinov, Eugene; and Brown, Richard P., 4,813,002, Cl. 365-49.000.
Nuske, Dieter: *See*—
Behnk, Gunter; and Nuske, Dieter, 4,811,461, Cl. 17-56.000.
N.V. Bekaert S.A.: *See*—
Lievens, Hugo; and Coppens, Wilfried, 4,811,583, Cl. 72-38.000.
Obata, Kenji; Yoneda, Nobuhiko; Kataita, Masabumi; I, Yoshihiro; and Yamashita, Hironori, to Mitsui Toatsu Chemicals, Incorporated. Evaporator. 4,812,203, Cl. 159-6.200.
Oberpichler, Gerd: *See*—
Honig, Ernst-August; Kaspar, Lothar; Kalversberg, Manfred; Oberpichler, Gerd; Hagemann, Gottfried; and Schmidt, Dieter, 4,811,631, Cl. 74-762.000.
O'Brien, Terence J.: *See*—
Phillips, Alan C.; and O'Brien, Terence J., 4,811,491, Cl. 33-366.000.
Phillips, Alan C.; O'Brien, Terence J.; and Taylor, Charles S., 4,811,613, Cl. 74-5.60D.
Ochi, Atsuo: *See*—
Honjo, Masahiro; Takeuchi, Akihiro; Ochi, Atsuo; Aki, Shinichi; Nakagawa, Yukio; and Kobayashi, Masaaki, 4,812,783, Cl. 331-20.000.
Ochi, Mitsutoshi: *See*—
Takemoto, Fumio; Kunishige, Tuneo; and Ochi, Mitsutoshi, 4,812,361, Cl. 428-397.000.
Ochii, Kiyofumi: *See*—
Kai, Hajime; and Ochii, Kiyofumi, 4,813,021, Cl. 365-194.000.
O'Connell, James P.: *See*—
McLaurin, Daniel A.; Fleming, Beverly M.; and O'Connell, James P., 4,812,293, Cl. 422-69.000.
Ocular Technologies, Inc.: *See*—
Chen, Richard Y. S., 4,812,598, Cl. 523-107.000.
Odaka, Kentaro: *See*—
Fukami, Tadashi; Ozaki, Shinya; and Odaka, Kentaro, 4,812,924, Cl. 360-32.000.
O'Donnell, Matthew: *See*—
Bottomley, Paul A.; Hardy, Christopher J.; O'Donnell, Matthew; and Roemer, Peter B., 4,812,760, Cl. 324-309.000.
Odorisio, Paul A.; Pastor, Stephen D.; and Hyun, James L., to Ciba-Geigy Corporation. 1,3,2-oxazaphospholidine stabilizers. 4,812,501, Cl. 524-117.000.
Oe, Yasuhiro: *See*—
Takahashi, Kazuyuki; Oe, Yasuhiro; and Yamamoto, Etushi, 4,811,487, Cl. 30-382.000.
Oelsch, Kurt. Process for producing potentiometer resistances. 4,811,479, Cl. 29-618.000.
Oetiker, Hans. Apparatus for preforming a substantially flat blank of an open clamp. 4,811,581, Cl. 72-14.000.
Ogata, Nobuo; Nakata, Yasuo; Satou, Hideaki; Tanaka, Toshiyuki; Minami, Etsuji; Yoshida, Yoshio; Kurata, Yukio; and Inoue, Teruaki, deceased (by Inoue, Takayuki, Kazuko Inoue, heirs), to Sharp Kabushiki Kaisha. Focusing error detector and optical data detecting device incorporating the focusing error detector. 4,812,638, Cl. 250-201.000.
Ogawa, Hidehiro; and Kazami, Kazuyuki, to Nikon Corporation. Drive control device in an ultrasonic vibration motor. 4,812,699, Cl. 310-316.000.
Ogawa, Kazufumi; Sasago, Masaru; Endo, Masayuki; and Ishihara, Takeshi, to Matsushita Electric Industrial Co., Ltd. Exposure apparatus. 4,812,880, Cl. 355-53.000.
Ogawa, Yasunori: *See*—
Okada, Sumie; Nara, Takashi; Hatano, Takashi; Kawato, Yutaka; Shimozono, Ryoji; Tsutsumi, Kenji; Ogawa, Yasunori; and Tanaka, Yasuo, 4,812,839, Cl. 340-825.140.
Oguri, Yasuo: *See*—
Chida, Yukio; Nishimura, Tetsunhiko; and Oguri, Yasuo, 4,812,698, Cl. 310-330.000.
O'Hanlon, Peter J.: *See*—
Rogers, Norman H.; O'Hanlon, Peter J.; Walker, Graham; and Crimmin, Michael J., 4,812,470, Cl. 514-365.000.
Ohara, Shuichi; Akasaka, Sinichi; Oka, Hiroyuki; and Hattori, Shintaroo, to Hitachi, Ltd. Color ink sheet for thermal transfer. 4,812,439, Cl. 503-227.000.
Ohara, Sinji, to NEC Corporation. Data output control system. 4,812,999, Cl. 364-518.000.
Ohashi, Masashi: *See*—
Kubota, Atsuhi; Sasaki, Nobukazu; Kasamura, Toshirou; Kusumoto, Toshihiko; Shiratori, Tatsuya; Ozawa, Takashi; Yamamoto, Yasuyoshi; Koike, Michiro; Ohashi, Masashi; and Kimura, Akiyoshi, 4,812,874, Cl. 355-7.000.
Ohashi, Yoshinobu: *See*—
Watanabe, Hideo; and Ohashi, Yoshinobu, 4,812,489, Cl. 522-42.000.
Ohba, Masahiro: *See*—
Matsumoto, Naoki; Kuraoka, Hiroaki; Ohoka, Naoto; and Ohba, Masahiro, 4,811,993, Cl. 303-100.000.
Ohba, Motoi: *See*—
Makimoto, Mitsuo; and Ohba, Motoi, 4,812,791, Cl. 333-219.000.
Ohike, Toshio: *See*—
Sato, Yoshitake; Ohike, Toshio; and Nakazaki, Youji, 4,812,749, Cl. 324-106.000.
Ohira, Kazuhiko: *See*—
Sugimura, You; Numa, Nobushige; Watanabe, Tadashi; Sugiyama, Yutaka; Ohira, Kazuhiko; and Yamaguchi, Sachio, 4,812,337, Cl. 427-407.100.
Ohishi, Noriake: *See*—
Nakagawa, Hiroaki; Kondo, Masahiro; and Ohishi, Noriake, 4,812,279, Cl. 264-311.000.
Ohkuma, Yoshinori: *See*—
Yamane, Kazuo; Mori, Masakazu; Tsuda, Takashi; Ohkuma, Yoshinori; and Suzuki, Kazuhiro, 4,813,048, Cl. 372-38.000.
Ohlig, Ernest. Graphic material registration apparatus and method. 4,812,883, Cl. 355-91.000.
Ohlsson, Thomas L.: *See*—
Bishop, H. John; Merriss, Morley M.; Ohlsson, Thomas L.; and Sopira, Terrence G., 4,813,035, Cl. 370-50.000.
Ohm, Christian: *See*—
Meurer, Kurt P.; Waniczek, Helmut; Ohm, Christian; and Witte, Josef, 4,812,546, Cl. 526-297.000.
Ohmori, Seishi: *See*—
Hatakeyama, Atsushi; Izumi, Masaki; and Ohmori, Seishi, 4,812,064, Cl. 400-622.000.

Ohmura, Hiroshi; Asano, Seiji; and Yoshida, Toshio, to Fuji Photo Film Co., Ltd. Lens-fitted photographic film package. 4,812,863, Cl. 354-219.000.

Ohmura, Hiroshi: *See*—
Ushiro, Seimei; Ohmura, Hiroshi; Cho, Michio; Tanaka, Tsutomu; Tanaka, Yasuhiko; Asano, Seiji; and Ohno, Kazunori, 4,812,866, Cl. 354-288.000.

Ohmuro, Hideaki: *See*—
Kakinuma, Koichiro; Ando, Makoto; Sawa, Masahiko; Ohmuro, Hideaki; Ohryo, Akira; and Nakamura, Tadahiko, 4,812,632, Cl. 235-479.000.

Ohnishi, Yoshizumi: *See*—
Yamamoto, Taizo; Konishi, Hirokazu; Kawaguchi, Yoshihisa; and Ohnishi, Yoshizumi, 4,811,802, Cl. 177-1.000.

Ohnishi, Youichi; Okuda, Akira; Shima, Hiromi; and Mizuguchi, Shinichi, to Matsushita Electric Industrial Co., Ltd. Plasma processing apparatus. 4,812,712, Cl. 315-176.000.

Ohno, Kazunori: *See*—
Ushiro, Seimei; Ohmura, Hiroshi; Cho, Michio; Tanaka, Tsutomu; Tanaka, Yasuhiko; Asano, Seiji; and Ohno, Kazunori, 4,812,866, Cl. 354-288.000.

Ohnuki, Ichiro: *See*—
Akashi, Akira; Ishizaki, Akira; Suda, Yasuo; Ohnuki, Ichiro; Ohtaka, Keiji; and Koyama, Takeshi, 4,812,869, Cl. 354-408.000.

Ohoka, Naoto: *See*—
Matsumoto, Naoki; Kuraoka, Hiroaki; Ohoka, Naoto; and Ohba, Masahiro, 4,811,993, Cl. 303-100.000.

Ohryo, Akira: *See*—
Kakinuma, Koichiro; Ando, Makoto; Sawa, Masahiko; Ohmuro, Hideaki; Ohryo, Akira; and Nakamura, Tadahiko, 4,812,632, Cl. 235-479.000.

Ohshima, Shigeru; and Sekiguchi, Takeshi, to Canon Kabushiki Kaisha. Adapter with built-in shutter. 4,812,911, Cl. 358-225.000.

Ohta, Satoshi; Tanagawa, Kouzi; Yamamoto, Hideo; and Kumagai, Keiji, to Oki Electric Industry Co., Ltd.; and Toa Nenryo Kogyo Kabushiki Kaisha. IC card with a solar battery. 4,812,634, Cl. 235-492.000.

Ohtaka, Keiji: *See*—
Akashi, Akira; Ishizaki, Akira; Suda, Yasuo; Ohnuki, Ichiro; Ohtaka, Keiji; and Koyama, Takeshi, 4,812,869, Cl. 354-408.000.

Ohtaki, Hiroshi: *See*—
Terada, Takashi; Aoki, Minoru; Ohtaki, Hiroshi; Morozumi, Manami; and Shiozaki, Mitsuharu, 4,812,560, Cl. 536-29.000.

Ohtani, Takayuki: *See*—
Matsui, Masataka; Iizuka, Tetsuya; Tsujimoto, Jun-ichi; Ohtani, Takayuki; and Isobe, Mitsuo, 4,813,022, Cl. 365-203.000.

Ohtola, Victoria L.: *See*—
Cornell, Lorne T.; Sisto, Eugene; Ohtola, Victoria L.; and Kenney, Lawrence P., 4,811,839, Cl. 206-303.000.

Ohuchi, Junichi: *See*—
Hasegawa, Kazuo; Ohuchi, Junichi; and Sasaki, Hiroaki, 4,812,642, Cl. 250-221.000.

Ohya, Koichi: *See*—
Yamamoto, Yoshihiro; Kume, Tsutomu; Yamazaki, Nobuo; Hashimoto, Fumiharu; and Ohya, Koichi, 4,812,773, Cl. 328-167.000.

Oi, Fumio; Osaki, Haruyoshi; Furuta, Akihiro; Uemura, Yukikazu; Ninomiya, Takao; Uetani, Yasunori; and Hanabata, Makoto, to Sumitomo Chemical Company, Limited. Novolak resin for positive photoresist. 4,812,551, Cl. 528-129.000.

Oinaga, Yuji: *See*—
Kitamura, Toshiaki; Onishi, Katsumi; and Oinaga, Yuji, 4,812,970, Cl. 364-200.000.

Oishi, Kengo, to Fuji Photo Film Company. Magnetic recording disc having tensioned and elastically-supported recording surface. 4,812,939, Cl. 360-135.000.

Oishi, Minoru; Morimoto, Yoshinari; Furukawa, Akihiro; Miura, Tomoko; Ikeda, Yoshie; and Nagatsuna, Akemi, to Brother Kogyo Kabushiki Kaisha. Input control device. 4,812,832, Cl. 340-709.000.

Oka, Hiroyuki: *See*—
Ohara, Shuichi; Akasaka, Sinichi; Oka, Hiroyuki; and Hattori, Shintaroo, 4,812,439, Cl. 503-227.000.

Oka, Masahiko: *See*—
Tatsukami, Yoshiharu; Doi, Toshiki; and Oka, Masahiko, 4,812,011, Cl. 350-96.340.

Okabe, Takeshi: *See*—
Kimura, Soosaku; Itoh, Masaya; and Okabe, Takeshi, 4,811,525, Cl. 51-166.0MH.

Okabe, Toshihiro: *See*—
Yamagiwa, Akira; and Okabe, Toshihiro, 4,812,684, Cl. 307-480.000.

Okada, Hisao: *See*—
Tanaka, Nobuo; Tominaga, Satoshi; Okada, Hisao; and Yoshida, Toshihiko, 4,813,069, Cl. 379-82.000.

Okada, Sumie; Nara, Takashi; Hatano, Takashi; Kawato, Yutaka; Shimozono, Ryoji; Tsutsumi, Kenji; Ogawa, Yasunori; and Tanaka, Yasuo, to Fujitsu Limited. System for controlling network activation sequence. 4,812,839, Cl. 340-825.140.

Okada, Takao; and Morimoto, Masamichi, to Olympus Optical Co., Ltd. Tunnel memory device having a multi-layered Langmuir-Blodgett film. 4,813,016, Cl. 365-107.000.

Okada, Yoshikazu; Sugawara, Jun; and Takizawa, Sumiyoshi, to Mitsubishi Kinzoku Kabushiki Kaisha. Surface coated tungsten carbide-base sintered hard alloy material for inserts of cutting tools. 4,812,370, Cl. 428-552.000.

Okamoto, Shingo; Kiryu, Masao; and Yoshida, Atsushi, to Nippon Oil and Fats Co., Ltd. Process for the production of patterned decorative materials. 4,812,336, Cl. 427-257.000.

Okamoto, Toshio; Doi, Miwako; and Iwai, Isamu, to Kabushiki Kaisha Toshiba. Document processing using heading rules storage and retrieval system for generating documents with hierarchical logical architectures. 4,813,010, Cl. 364-900.000.

Okawa, Masao: *See*—
Asano, Koji; and Okawa, Masao, 4,811,834, Cl. 198-621.000.

Okayasu, Kenji, to Rikio Co., Ltd. Footwear. 4,811,501, Cl. 36-94.000.

Okazaki, Naoto: *See*—
Sato, Toru; Okazaki, Naoto; and Hiyoshi, Katsumi, 4,812,310, Cl. 424-101.000.

Oki Electric Industry Co., Ltd.: *See*—
Isobe, Minoru, 4,812,914, Cl. 358-293.000.
Ohta, Satoshi; Tanagawa, Kouzi; Yamamoto, Hideo; and Kumagai, Keiji, 4,812,634, Cl. 235-492.000.
Tanoshima, Katsuhide; Suzuki, Yasuhiro; Nagata, Shiruo; and Shimizu, Yasuo, 4,813,007, Cl. 346-74.500.

Okita, Tsutomu; Aonuma, Masashi; and Hashimoto, Hiroshi, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,812,351, Cl. 428-141.000.

Okochi, Kastuhiko; Toya, Mitsuo; Naito, Masahito; Inoue, Yoshiaki; and Egusa, Takahiro, to Daikin Industries, Ltd. Control apparatus for an air conditioning system. 4,812,997, Cl. 364-505.000.

Okuda, Akira: *See*—
Ohnishi, Youichi; Okuda, Akira; Shima, Hiromi; and Mizuguchi, Shinichi, 4,812,712, Cl. 315-176.000.

Okuda, Hidefumi: *See*—
Kuwajima, Teruaki; Uenoyama, Kazuo; Takae, Masaki; and Okuda, Hidefumi, 4,812,335, Cl. 427-407.100.

Okuma, Shigeki; and Hagiwara, Masato, to Koito Manufacturing Co., Ltd. Very-wide-angle nozzle unit for headlight cleaner. 4,811,903, Cl. 239-284.200.

Okumura, Atsuo; and Demura, Takayuki, to Toyota Jidosha Kabushiki Kaisha. Double air-fuel ratio sensor system having improved exhaust emission characteristics. 4,811,557, Cl. 60-274.000.

Okumura, Shigemi: *See*—
Hirosawa, Toshio; Kurihara, Jun'ichi; and Okumura, Shigemi, 4,812,967, Cl. 364-200.000.

Okumura, Takatoshi: *See*—
Nishi, Kazuhiko; Ishii, Takatoshi; Yamashita, Ryozo; Yamaoka, Shigemitsu; and Okumura, Takatoshi, 4,812,828, Cl. 340-706.000.

Okunuki, Masahiko: *See*—
Goto, Susumu; Kumabe, Yuichi; and Okunuki, Masahiko, 4,812,662, Cl. 250-491.100.

Okura, Masahiko. Ratchet device adaptable to various screw-rotating tools. 4,811,636, Cl. 81-63.200.

Old, John L.; and Summers, Harry, to Massey-Ferguson Services N.V. Throttle controls. 4,811,620, Cl. 74-474.000.

O'Leary, Paul; and Orben, Hans-Josef, to Deutsche ITT Industries GmbH. Circuit for checking the coincidence of a data word with a reference data word. 4,812,809, Cl. 340-146.200.

Olin Corporation: *See*—
Rothgery, Eugene F.; Hart, William W. C.; Smith, Edward F., III; Phillips, Steven D.; Sandel, Bonnie B.; and Gavin, David F., 4,812,896, Cl. 357-70.000.

Olsen, Gordon E.: *See*—
Helsley, Grover C.; Davis, Larry; and Olsen, Gordon E., 4,812,456, Cl. 514-225.500.

Olympus Optical Co., Ltd.: *See*—
Kikuchi, Juro, 4,812,023, Cl. 350-427.000.
Okada, Takao; and Morimoto, Masamichi, 4,813,016, Cl. 365-107.000.
Shimada, Yoshihiro; Fujihara, Tadafumi; Nagano, Chikara; and Tsukamoto, Katsuo, 4,812,039, Cl. 356-129.000.
Takenaga, Hideo, 4,812,940, Cl. 360-137.000.

Omura, Takashi; and Yokogawa, Kazufumi, to Sumitomo Chemical Company, Limited. Triazine compound having two vinylsulfone type fiber reactive groups. 4,812,558, Cl. 534-618.000.

Onan Corporation: *See*—
Fanner, John C., 4,812,266, Cl. 261-71.000.

Onanhian, Richard A. Microscope system. 4,812,029, Cl. 350-523.000.

O'Neil, James P.; and Powell, Ken R., to Term-Tronics, Incorporated. Method and apparatus for vending. 4,812,629, Cl. 235-383.000.

Ong, Chungjian J., to American Cyanamid Company. Gel insecticidal compositions. 4,812,309, Cl. 424-84.000.

Onimaru, Sadahisa: *See*—
Tashiro, Syuzaburou; Ina, Toshikazu; Nakano, Osamu; Taguchi, Masahiro; Onimaru, Sadahisa; and Kuno, Akira, 4,812,838, Cl. 340-825.060.

Onishi, Katsumi: *See*—
Kitamura, Toshiaki; Onishi, Katsumi; and Oinaga, Yuji, 4,812,970, Cl. 364-200.000.

Ono, Hiromi; and Shirai, Tetsuaki, to Kawasaki Jukogyo Kabushiki Kaisha. Horizontal-shaft OHV engine. 4,811,705, Cl. 123-195.0AC.

Ono Pharmaceutical Co., Ltd.: *See*—
Masuda, Yoshinobu, 4,812,475, Cl. 514-412.000.

Ono, Seigo: *See*—
Ebina, Osamu; and Ono, Seigo, 4,812,829, Cl. 340-709.000.

Ono, Takuhiro: *See*—
Miyata, Takeo; Ono, Takuhiro; Iwabuchi, Takashi; Ikedo, Masaru; and Watari, Masafumi, 4,812,016, Cl. 350-320.000.

Onoda Cement Company, Ltd.: *See*—
Yamamoto, Masahiro; Kumata, Mituyosi; Kozoe, Katutoshi; and Itoh, Tsutomu, 4,811,689, Cl. 118-624.000.

Onoda, Kazuo: *See*—
Hayakawa, Futomi; and Onoda, Kazuo, 4,812,620, Cl. 219-347.000.
Onodera, Akira: *See*—
Watanabe, Yoshiaki; Yokoo, Chihiro; Goi, Masami; Onodera, Akira; Murata, Mitsuo; Fukushima, Hiroshi; and Sota, Kaoru, 4,812,562, Cl. 540-227.000.
Onoe, Teruhiko: *See*—
Sakai, Hiroyuki; Yoshioka, Kazutoshi; Matsumura, Kimiharu; Shigaki, Keisuke; Amemiya, Yutaka; Iimuro, Shunichi; Yoshioka, Haruhiko; and Onoe, Teruhiko, 4,812,201, Cl. 156-643.000.
Ooi, Satoru: *See*—
Meguro, Kanji; Fujita, Takeshi; Hatanaka, Chitoshi; and Ooi, Satoru, 4,812,570, Cl. 546-280.000.
Ooki, Tutomu: *See*—
Saiki, Goro; Kondo, Jiro; Takeda, Koichi; Maki, Mutsuo; and Ooki, Tutomu, 4,812,166, Cl. 75-0.50C.
Oono, Yasuteru: *See*—
Ito, Akio; Sawa, Hidenori; Sugisaka, Hiroshi; Hayashi, Shigeaki; Nakagawa, Hiroto; Oono, Yasuteru; and Haraguchi, Eiji, 4,812,729, Cl. 318-732.000.
Nakagawa, Hiroto; Oono, Yasuteru; Kato, Tadastsu; Nagura, Osamu; Niwa, Sadahiko; Furukawa, Yosio; and Kayukawa, Shigehiro, 4,812,730, Cl. 318-732.000.
Ootsuka, Hiroshi: *See*—
Fujino, Akihiko; Ootsuka, Hiroshi; and Izumi, Tatsuro, 4,812,862, Cl. 354-21.000.
Iida, Takashi; Itoh, Masatoshi; Fukuoka, Hidenori; Tsukamoto, Takeya; Hamada, Masataka; Ishibashi, Kenji; and Ootsuka, Hiroshi, 4,812,912, Cl. 358-227.000.
Opelt, Christian. Method and arrangement for drop-out compensation during the reproduction of magnetically recorded signals. 4,812,925, Cl. 360-38.100.
Oppie, Alfred L.; and Samish, Peter. Intake port for internal combustion engines. 4,811,702, Cl. 123-188.00M.
Orben, Hans-Josef: *See*—
O'Leary, Paul; and Orben, Hans-Josef, 4,812,809, Cl. 340-146.200.
O'Rell, Dennis D.; and Holleran, Peter M., to W. R. Grace & Co.-Conn. Printing blanket. 4,812,357, Cl. 428-246.000.
Orrell, Elisabeth D.: *See*—
Mullin, John B.; Hamilton, John C.; Orrell, Elisabeth D.; Jacobs, Philip R.; and Shenai-Khatkhate, Deodattta V., 4,812,586, Cl. 556-129.000.
Ortiz Jr., Angel L., to General Electric Company. High power optical fiber failure detection system. 4,812,641, Cl. 250-205.000.
Osaka, Keiji; Yanagi, Toru; and Asano, Yasuo, to Sumitomo Electric Industries, Ltd. Apparatus for arranging a plurality of coated optical fibers and collective fusion splicing method using the apparatus. 4,812,010, Cl. 350-96.220.
Osaki, Haruyoshi: *See*—
Oi. Fumio; Osaki, Haruyoshi; Furuta, Akihiro; Uemura, Yukikazu; Ninomiya, Takao; Uetani, Yasunori; and Hanabata, Makoto, 4,812,551, Cl. 528-129.000.
Osborn, Glenn M.; and Essert, Robert D., to Amphenol Corporation. Fiber optic connector with colley retention. 4,812,006, Cl. 350-96.210.
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Osmond, Philippe: *See*—
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Lacquement, Ralph G.; and Ruggles, William L., 4,811,696, Cl. 122-4.00D.
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Piascinski, Joseph J., to RCA Licensing Corporation. Ultraviolet-resistant noise-reducing member and method of making same. 4,812,485, Cl. 521-82.000.
Pierik, Henry, to California Pellet Mill Company. Mash pelletizing method. 4,812,324, Cl. 426-624.000.
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Taylor, Michael P., 4,812,965, Cl. 364-550.000.
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Makhlouf, Joseph M.; Chau, Michael M.; and Freid, James R., 4,812,508, Cl. 524-764.000.

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Press, Reuben F. Portable saw with movable warning. 4,811,488, Cl. 30-391.000.

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Query, Daniel S.; and Zummer, Linda A., to Whirlpool Corporation. Fiber optic door sensor for a domestic appliance. 4,812,810, Cl. 340-545.000.

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Quinn, Robert O., to Snap-on Tools Corporation. Digital engine analyzer. 4,812,768, Cl. 324-379.000.

Quipp Incorporated: *See*—
Sjogren, Christer A.; and D'Amico, Carl, 4,812,099, Cl. 414-788.200.

Raats, Herman; Schmidt, Manfred; and Zanner, Johann, to Agfa-Gevaert AG. Device for loading and unloading X-ray film cassettes. 4,811,547, Cl. 53-266.00R.

Raddatz, Peter; Holzemann, Gunter; Jonczyk, Alfred; Schmitges, Claus J.; and Minck, Klaus O., to Merck Patent Gesellschaft mit Beschrankter Haftung. Peptides possessing renin inhibitory activity. 4,812,555, Cl. 530-323.000.

Rademacher, Wilhelm: *See*—
Jahn, Dieter; Keil, Michael; Kolassa, Dieter; Schirmer, Ulrich; Wuerzer, Bruno; Meyer, Norbert; Jung, Johann; and Rademacher, Wilhelm, 4,812,160, Cl. 71-88.000.

Radian Corporation: *See*—
Bell, Ronald B., 4,811,555, Cl. 60-39.060.

Raike, George W., to Great Wave Company, Inc., The. Pneumatic/hydraulic wave generator. 4,812,077, Cl. 405-79.000.

RAM Dynamics, Inc.: *See*—
Horan, Thomas R.; and Hart, Kyle E., 4,811,568, Cl. 62-200.000.

Ramanathan, Ramamurthy: *See*—
Quinlan, Michael A.; Ramanathan, Ramamurthy; and Wise, Henry, 4,812,300, Cl. 423-404.000.

Rand, Paul K.: *See*—
Newell, Robert E.; Rand, Paul K.; and Fitzsimmons, Robert A., 4,811,731, Cl. 128-203.150.

Random House, Inc.: *See*—
Dorsey-Zinn, Denise; Meiser, Sue M.; and Cassidy, Michael F., 4,811,951, Cl. 273-157.00R.

Rankin, Joseph W. Storage and dispensing device. 4,811,998, Cl. 312-229.000.

Ranly, Hans: *See*—
Schmelz, Helmut; Thomann, Helmut; Kuschke, Renate; Wilbert, Eva-Helga; Gajewski, Wolfgang; Sprehe, Josef; Landgraf, Norbert; Ranly, Hans; Balling, Lothar; Reppisch, Richard; and Hein, Dietmar, 4,812,296, Cl. 423-239.000.

Rapp, Albert B. Structural element for a building. 4,811,770, Cl. 52-309.120.

Rathi, Bharat D.: *See*—
Kumar, Manoj; Goyal, Ambuj; and Rathi, Bharat D., 4,813,044, Cl. 371-55.000.

Rau, Thomas, to Volkswagen AG. Torsion-stressed component part of superposed fiber layers. 4,812,348, Cl. 428-113.000.

Raue, Roderich: *See*—
Harnisch, Horst; and Raue, Roderich, 4,812,379, Cl. 430-110.000.

Raulin, Philippe; Messer, Jean-Pierre; Cherbuy, Bernard; and Estavoyer, Jacques, to Bull, S.A. Method of manufacturing a magnetic transducer including a plurality of beads. 4,811,476, Cl. 29-603.000.

Rausing, Hans, to AB Tetra Pak. Packing containers and blanks therefor. 4,811,849, Cl. 206-621.200.

Raychem Corp.: *See*—
Tomita, Akira; and Ostasiuk, Mark, 4,812,001, Cl. 350-96.300.

Raychem GmbH: *See*—
Eberhard, Koch U.; and Bodo, Boettcher, 4,812,944, Cl. 361-127.000.

Raymond, Bruce C.; and Fink, Richard A., to Honeywell Inc. Magnetic particle clutch. 4,811,823, Cl. 192-21.500.

Raymond, Roger S.: *See*—
Dowling, Charles; and Raymond, Roger S., 4,811,890, Cl. 228-157.000.

Raytheon Company: *See*—
Freedman, Nathan; Keene, Wayne H.; and Jelalian, Albert V., 4,812,035, Cl. 356-5.000.

RCA Licensing Corp.: *See*—
Altenschulte, Raymond A.; and Grabow, Glen M., 4,812,130, Cl. 439-84.000.
Chang, Kern K. N., 4,812,708, Cl. 313-477.00R.

Haferl, Peter E., 4,812,720, Cl. 315-411.000.
Piasecinski, Joseph J., 4,812,485, Cl. 521-82.000.

Rea, Jeffrey E., to Borg-Warner Automotive, Inc. Mechanism for eliminating gear rattle in a shiftable transmission. 4,811,615, Cl. 74-375.000.

Rech, Armin: *See*—
Hermann, Horst; Binoder, Wilhelm; Rech, Armin; Rech, Gerd; and Reinhardt, Gunter, 4,812,979, Cl. 364-431.010.

Rech, Gerd: *See*—
Hermann, Horst; Binoder, Wilhelm; Rech, Armin; Rech, Gerd; and Reinhardt, Gunter, 4,812,979, Cl. 364-431.010.

Redenbaugh, Jill M.: *See*—
Merchant, Abid N.; Burke, Kenneth C.; and Redenbaugh, Jill M., 4,812,256, Cl. 252-162.000.

Redig, Michael J.; and Prater, David M., to Hewlett-Packard Company. Device for synchronizing the output pulses of a circuit with an input clock. 4,813,005, Cl. 364-580.000.

Reed, Thomas F.: *See*—
Erickson, David E.; and Reed, Thomas F., 4,812,550, Cl. 527-201.000.

Regan, Paul. Athletic garment for protecting genital area. 4,811,427, Cl. 2-2.000.

Reghi, Gary A., to Parker Chemical Company. Passivation process and copmposition for zinc-aluminum alloys. 4,812,175, Cl. 148-258.000.

Regipa, Robert. Process for assembling two films, in particular films of a few microns thickness. 4,812,189, Cl. 156-201.000.

Regnier, Gerard S., to Silicon General, Inc. Variable gain amplifier. 4,812,781, Cl. 330-254.000.

Reif, Thomas H.; Warnken, Louis E.; and Snyder, Roy A. Urinary catheter package. 4,811,847, Cl. 206-571.000.

Reifenhauser GmbH & Co. Maschinenfabrik: *See*—
Balk, Hermann, 4,812,112, Cl. 425-66.000.

Reimann, Klaus: *See*—
Coenen, Hubert; Hagen, Rainer; and Reimann, Klaus, 4,812,233, Cl. 210-177.000.

Reinartz, Hans D.; Steffes, Helmut; Maas, Joachim; and Schwarz, Thomas, to Alfred Teves GmbH. Traction slip control device. 4,811,809, Cl. 180-197.000.

Reinebach, Lewis C. Mailbox signaling device. 4,811,895, Cl. 232-35.000.

Reinhardt, Gunter: *See*—
Hermann, Horst; Binoder, Wilhelm; Rech, Armin; Rech, Gerd; and Reinhardt, Gunter, 4,812,979, Cl. 364-431.010.

Reinke, Claudia: *See*—
Buchmann, Stephan; Leuenberger, Hans; and Reinke, Claudia, 4,812,407, Cl. 435-291.000.

Reis, Virginia H. Orange juice hair treatment method. 4,811,747, Cl. 132-203.000.

Reischig, Dirk; Hettche, Helmut; and Brade, Wolfgang, to Degussa Aktiengesellschaft. Synergistic combination of amantadiene and selegiline. 4,812,481, Cl. 514-647.000.

Reist, Walter, to Ferag AG. Method of, and apparatus for, fabrication of portable tubular-shaped packages formed of printed products, such as newspapers, periodicals, and the like and portable package produced according to the method. 4,811,548, Cl. 53-409.000.

Remington, John L.; and Seidel, Harry W., to Stanley Works, The. Cabinet with pivoted locking outrigger. 4,811,999, Cl. 312-250.000.

Rempel, Garry L.; Mohammadi, Navroz A.; and Farwaha, Rajeev, to University of Waterloo. Polymer hydrogenation process. 4,812,528, Cl. 525-338.000.

Renault Vehicules Industriels: *See*—
Monquin, Felix; and Condamin, Bernard, 4,811,629, Cl. 74-710.500.

Renzi, Fiorenzo; Rivetti, Franco; Romano, Ugo; and Gagliardi, Claudio, to Enichem Sintesi S.p.A. Process for the preparation of substitutes for optical glasses and polymerizable liquid composition suitable to that purpose. 4,812,545, Cl. 526-230.500.

Reppisch, Richard: *See*—
Schmelz, Helmut; Thomann, Helmut; Kuschke, Renate; Wilbert, Eva-Helga; Gajewski, Wolfgang; Sprehe, Josef; Landgraf, Norbert; Ranly, Hans; Balling, Lothar; Reppisch, Richard; and Hein, Dietmar, 4,812,296, Cl. 423-239.000.

Republic Money Orders, Inc.: *See*—
Smith, Lawrence G., 4,812,986, Cl. 364-479.000.

Rericha, Brian F.; and Stritzke, Bernard G., to Microdot Inc. Valve stem seal. 4,811,703, Cl. 123-188.00P.

Rericha, Brian F.: *See*—
Stritzke, Bernard G.; and Rericha, Brian F., 4,811,960, Cl. 277-153.000.

Research Development Corporation: *See*—
Narumiya, Shuh; Hayaishi, Osamu; Kimura, Yoshiharu; and Tsuboshima, Masami, 4,812,457, Cl. 514-226.200.

Reyneri, Leonardo M., to Agence Spatiale Europeenne. Very low power analog multiplexers. 4,813,041, Cl. 370-112.000.

Rice, Ronald B.; Lobo, Edward M.; Casanova, Hector A.; and Kosnosky, Theodore P., to Magnetec Corporation. Capacitor and method of manufacture. 4,812,941, Cl. 361-15.000.

Ricoh Company, Ltd.: *See*—
Shimada, Kazuyuki, 4,813,046, Cl. 372-38.000.
Suzuki, Shigeru, 4,812,917, Cl. 358-293.000.

Rideout, Darryl C., to Scripps Clinic and Research Foundation. In situ active compound assembly. 4,812,449, Cl. 514-183.000.

Riedel, Ernest P.; and Boenning, Robert A., to Westinghouse Electric Corp. Method and apparatus for optically detecting circuit malfunctions. 4,812,037, Cl. 356-35.000.

Riedl, Reinhold, to haacon hebetechnik gmbh. Overhang arms for rack and pinion jack of a lifting and depositing device for transportable large containers or the like. 4,811,930, Cl. 254-45.000.

Riedner, William E.: *See*—
Smith, Harry E.; and Riedner, William E., 4,812,102, Cl. 414-280.000.

Riemenschneider, Bert R., to Texas Instruments Incorporated. Capacitive coupling. 4,812,885, Cl. 357-23.500.

Ries, Guenter, to Siemens Aktiengesellschaft. Quench propagation device for a superconducting magnet. 4,812,796, Cl. 335-299.000.

Rieter Machine Works Limited: *See*—
Busenhart, Peter; Schneeberger, Ruedi; Holbein, Erwin; Wirz, Armin; Flueli, Adolf; and Maier, Hansueli, 4,811,910, Cl. 242-18.00R.

Rifi, Mahmoud R., to Union Carbide Corporation. Impact polypropylene. 4,812,526, Cl. 525-240.000.

Riggi, Michael S. Shoulder strap retainer. 4,811,876, Cl. 224-264.000.

Riggs, Arthur D., to Genentech, Inc. Somatostatin peptide conjugate. 4,812,554, Cl. 530-311.000.

Rijnstaal B.V.: *See*—
Dackus, Arnold J. G.; and Brasser, Cornelis G. J., 4,811,889, Cl. 228-148.000.

Rikio Co., Ltd.: *See*—
Okayasu, Kenji, 4,811,501, Cl. 36-94.000.

Rilk, Albrecht: *See*—
Egle, Wilhelm; Ottenameyer, F. Peter; and Rilk, Albrecht, 4,812,652, Cl. 250-311.000.

Rindfleisch, Karl H.: *See*—
Bayerlein, Friedrich K.; Leuerer, Dietrich R. K.; and Rindfleisch, Karl H., 4,812,842, Cl. 340-825.720.

Rinne, Albert W.: *See*—
Langer, Alois A.; and Rinne, Albert W., 4,812,724, Cl. 318-599.000.

Rise, Leif. Quick release fasteners. 4,811,469, Cl. 24-664.000.

Rivard, Daniel, to ETS. Rivard S.A. Mechanized unit for digging a trench and laying elongate objects. 4,812,078, Cl. 405-179.000.

Rivers, Jerry B., to Domtar Gypsum Inc. Gypsum dissolution system. 4,812,045, Cl. 366-107.000.

Rivetti, Franco: *See*—
Renzi, Fiorenzo; Rivetti, Franco; Romano, Ugo; and Gagliardi, Claudio, 4,812,545, Cl. 526-230.500.

Rixen, Edgar, to Robert Krups Stiftung & Co. KG. Electrically operated coffee making machine. 4,811,657, Cl. 99-295.000.

Robbins, James K., to Marathon Corporation. Mechanical lock-in device for a front loader compaction assembly. 4,811,660, Cl. 100-229.00A.

Robert Bosch GmbH: *See*—
Braun, Wolfgang; Emsmann, Wulf; Konrath, Karl; Krieger, Klaus; and Nothdurft, Heinz, 4,811,709, Cl. 123-357.000.
Egler, Walter, 4,811,899, Cl. 239-5.000.
Friedow, Michael, 4,811,994, Cl. 303-115.000.
Guntert, Josef; and Warga, Johann, 4,811,716, Cl. 123-503.000.
Schmitt, Alfred; Stumpp, Gerhard; Trachte, Dietrich; and Wessel, Wolf, 4,811,710, Cl. 123-359.000.
Stumpp, Gerhard; and Wessel, Wolf, 4,811,711, Cl. 123-359.000.

Robert Krups Stiftung & Co. KG: *See*—
Rixen, Edgar, 4,811,657, Cl. 99-295.000.

Roberts, Eugene, to City of Hope. Method for the treatment of nervous system degeneration. 4,812,447, Cl. 514-170.000.

Roberts, Ian A.; and Hargis, Colin, to Central Electricity Generating Board, The. Apparatus for monitoring earth faults on the rotor winding of a generator. 4,812,751, Cl. 324-546.000.

Roberts, John T., to Poly Pro, Inc. Homogeneously fusion bonded cartridges. 4,811,861, Cl. 221-197.000.

Robishaw, Alces P.; and Robishaw, Paul A. Construction transportation system. 4,811,681, Cl. 114-267.000.

Robishaw, Paul A.: *See*—
Robishaw, Alces P.; and Robishaw, Paul A., 4,811,681, Cl. 114-267.000.

Robison, Vincent R. Spare tire carrier. 4,811,874, Cl. 224-42.210.

Robitaille, Thierry, to Sappel. Device for making flowmeter tamper-proof. 4,811,600, Cl. 73-272.00R.

Rocamat: *See*—
D'Epenoux, Francois, 4,811,537, Cl. 52-385.000.

Rocchini, Carlo A.: *See*—
Valeri, Marco; and Rocchini, Carlo A., 4,813,012, Cl. 364-900.000.

Rockwell, David A.: *See*—
Byren, Robert W.; and Rockwell, David A., 4,812,639, Cl. 250-203.00R.

Rockwell-Golde G.m.b.H.: *See*—
Kruger, Peter; and Federmann, Dieter, 4,811,985, Cl. 296-214.000.

Rockwell International Corporation: *See*—
Dowling, Charles; and Raymond, Roger S., 4,811,890, Cl. 228-157.000.

Rode, Melvin A.: *See*—
Edwards, Thomas L.; El-Ibiary, Yehia M.; Gunda, Rajamouli; Leemhuis, Richard S.; Phillips, Fred H.; and Rode, Melvin A., 4,811,561, Cl. 60-368.000.

Rodime PLC: *See*—
Stewart, Alexander; Furness, Duncan S.; and Bhatia, Sham P., 4,812,929, Cl. 360-77.070.

Rodman, Clarke A.: *See*—
Farley, Radcliffe W.; Vaughn, Edward A.; Rodman, Clarke A.; and Homonoff, Edward C., 4,812,283, Cl. 264-518.000.

Roemer, Peter B.: *See*—
Bottomley, Paul A.; Hardy, Christopher J.; O'Donnell, Matthew; and Roemer, Peter B., 4,812,760, Cl. 324-309.000.

Roestenberg, Jerome R. Storable water curtain sanding air system. 4,811,526, Cl. 51-270.000.
Rofer, David; Hyzin, Peter J.; and Conrad, Thomas W., to ITT Corporation. Surface mount connector. 4,812,129, Cl. 439-79.000.
Rogers Corporation: *See*—
Barton, Carlos L.; Lindsay, Adrienne; and Henson, Samuel W., 4,812,213, Cl. 204-15.000.
Rogers, Norman H.; O'Hanlon, Peter J.; Walker, Graham; and Crimmin, Michael J., to Beecham Group p.l.c. Antibacterial monic acid derivatives. 4,812,470, Cl. 514-365.000.
Rogers, Randall J.; Silverman, Beth Z.; and Lewis, Armand F. Floppy disk liner with improved cleaning ability. 4,812,938, Cl. 360-133.000.
Rohm, Peter: *See*—
Hammann, Rainer; Weber, Friedrich; and Rohm, Peter, 4,812,408, Cl. 435-296.000.
Rohringer, Ernst. Double-walled special refuse dump receptacle. 4,811,535, Cl. 52-249.000.
Roibox OY: *See*—
Puumalainen, Pertti; and Kuusela, Reijo, 4,812,665, Cl. 250-571.000.
Rolfe, John A.; Dalton, Arthur W.; and Silvester, Robert, to Rolfe & King Limited of the Lansbury Estate. Electrical services pole. 4,812,958, Cl. 362-431.000.
Rolfe & King Limited of the Lansbury Estate: *See*—
Rolfe, John A.; Dalton, Arthur W.; and Silvester, Robert, 4,812,958, Cl. 362-431.000.
Roller, Traugott, to Daimler-Benz Aktiengesellschaft. Windshield wiper installation. 4,811,451, Cl. 15-250.040.
Rolls-Royce PLC: *See*—
Allen, David J.; Martin, Joseph; Rose, Peter E.; and Terry, John, 4,811,778, Cl. 164-516.000.
Purgavie, Duncan G., 4,812,106, Cl. 415-139.000.
Romano, Ugo: *See*—
Renzi, Fiorenzo; Rivetti, Franco; Romano, Ugo; and Gagliardi, Claudio, 4,812,545, Cl. 526-230.500.
Romanowski, Christopher A.; and Landero, Herman, to Hunter Engineering Company, Inc. Feed tip and continuous casting method using the feed tip. 4,811,781, Cl. 164-480.000.
Romanski, Eric R., to Albany International Corp. Method of making a paper machine press belt. 4,812,185, Cl. 156-86.000.
Romer, Michael: *See*—
Krause, Joachim; Romer, Michael; Pohl, Ludwig; Scheuble, Bernhard; and Weber, Georg, 4,812,258, Cl. 252-299.610.
Ron-Li Corporation: *See*—
Higgins, Ronald E., 4,811,695, Cl. 119-106.000.
Ronco Laboratories, Inc.: *See*—
Baseman, Maurice S., 4,812,503, Cl. 524-226.000.
Rosch, Fritz, to Alcan Aluminiumwerk Nurnberg GmbH. Internal combustion engine piston with laterally offset crudgeon-pin bore in piston head and body portions. 4,811,654, Cl. 92-216.000.
Rose, Peter E.: *See*—
Allen, David J.; Martin, Joseph; Rose, Peter E.; and Terry, John, 4,811,778, Cl. 164-516.000.
Rose, William H.: *See*—
Fleak, David S.; Rose, William H.; and Taylor, Attalee S., 4,812,133, Cl. 439-248.000.
Rosenberg, Avraham: *See*—
Levy, Amir; Glickman, Ilan; Berezniak, Haim; and Rosenberg, Avraham, 4,811,664, Cl. 102-226.000.
Rossi, Hannu, to Kone Oy. Disk brake motor. 4,811,820, Cl. 188-71.600.
Rossi, John P. System for compensating for the violation of the constant luminance principle in color television systems. 4,812,905, Cl. 358-32.000.
Rossi, Piergiorgio; and Calanchi, Massimo, to Eurand Italia S.p.A. Process for the preparation of stabilized isosorbide-5-mononitrate tablets, being also of sustained release, and formulations thus obtained. 4,812,316, Cl. 424-468.000.
Rothgery, Eugene F.; Hart, William W. C.; Smith, Edward F., III; Phillips, Steven D.; Sandel, Bonnie B.; and Gavin, David F., to Olin Corporation. Metal electronic package sealed with thermoplastic having a grafted metal deactivator and antioxidant. 4,812,896, Cl. 357-70.000.
Rothman, Michael L. Portable surgical drainage platform. 4,811,937, Cl. 269-327.000.
Roudebush, Dennis A.: *See*—
Stevens, Robert E.; and Roudebush, Dennis A., 4,811,901, Cl. 239-138.000.
Rouey, Alexandre: *See*—
Ambrosino, Jean-Louis; Cohen, Choua; Cheron, Jacques; and Rouey, Alexandre, 4,812,250, Cl. 252-67.000.
Rouille, Philippe; and Jezequel, Roland, to Thomson-CSF. System for generating frame sweeping with laser beam, in particular for projecting images. 4,812,000, Cl. 350-6.600.
Roussel Uclaf: *See*—
Buendia, Jean; and Nierat, Jeanine, 4,812,512, Cl. 525-54.110.
Roux, Robert. Tool for dressing an electric cable. 4,811,485, Cl. 30-90.100.
Rovenszky, Franz: *See*—
Binder, Dieter; and Rovenszky, Franz, 4,812,472, Cl. 514-374.000.
Rowland, David B.; and Smith, William W., Jr., to Rowland, David B. Safety alert and locating system. 4,813,025, Cl. 367-6.000.
Rowlands, Hugh: *See*—
Woods, Daniel E.; Gocht, Ronald E.; Higgins, Peter M.; Edwards, Anne M.; Rowlands, Hugh; Scanlon, Edward F.; and Putzer, Jerry, 4,813,077, Cl. 382-7.000.
Royal Technology, Inc.: *See*—
Humphreys, Robert E.; and Gray, Steven M., 4,813,070, Cl. 379-213.800.
RTR Oil Sands (Alberta) Ltd.: *See*—
Corti, Aldo; and Falcon, John A., 4,812,225, Cl. 208-13.000.
Rudolph, Frank W., to Wilson Greatbatch Ltd. Anode coating for lithium cell. 4,812,376, Cl. 429-101.000.
Rudy, John E.: *See*—
Abel, Kenneth N.; and Rudy, John E., 4,812,742, Cl. 324-73.00R.
Ruf, Wolfgang: *See*—
Wagensonner, Eduard; Ruf, Wolfgang; Fuchsberger, Hermann; and Birgmeir, Klaus, 4,812,903, Cl. 358-80.000.
Ruffell, John P.: *See*—
Douglas-Hamilton, D. H.; and Ruffell, John P., 4,812,663, Cl. 250-492.20R.
Ruggles, William L.: *See*—
Lacquement, Ralph G.; and Ruggles, William L., 4,811,696, Cl. 122-4.00D.
Ruopsa, Jon A. Particle collection system with spoiler. 4,811,527, Cl. 51-270.000.
Rusk, James A. Playground unit having governer for controlling rotational speed. 4,811,942, Cl. 272-33.00R.
Russell, Ernest J.; and Choi, M. K., to Burlington Industries, Inc. Continuous aqueous dyeing process for high-tenacity industrial nylon fabrics. 4,812,140, Cl. 8-492.000.
Rust, Ray D.: *See*—
George, Carroll H.; and Rust, Ray D., 4,812,217, Cl. 204-192.120.
Rutty, Brian R.; and Walshe, John J., to Arthur Guinness Son and Company Limited. Unified assembly for control of fluid flow and a liquid dispensing system which includes such an assembly. 4,811,862, Cl. 222-63.000.
Ruzek, David C., to Geo. A. Hormel & Co. Process for vacuum packaging fresh meat products. 4,812,320, Cl. 426-393.000.
Rydell, Mark A., to Schneider-Shiley (USA) Inc. Self-purging balloon catheter. 4,811,737, Cl. 128-344.000.
Rymo, Lars: *See*—
Vahlne, Anders; Svennerholm, Bo; Rymo, Lars; Jeansson, Stig; and Horal, Peter, 4,812,556, Cl. 530-324.000.
Ryobi Ltd.: *See*—
Takahashi, Kazuyuki; Oe, Yasuhiro; and Yamamoto, Etushi, 4,811,487, Cl. 30-382.000.
Ryobi Motor Products Corp.: *See*—
Steadings, Stephen W., 4,811,450, Cl. 15-337.000.
Sumerau, William R., 4,811,452, Cl. 15-337.000.
Saari, Walfred S., to Merck & Co., Inc. Carbamates of 4-hydroxyanisole as prodrugs for chemotherapy of melanoma. 4,812,590, Cl. 860-137.000.
Saber, Paik: *See*—
Chung, Paul W.; and Saber, Paik, 4,812,784, Cl. 331-113.00R.
Sagane, Toshihiro; and Lenz, Robert W. Liquid crystalline polymer. 4,812,548, Cl. 526-313.000.
Sagara, Kazuhiko: *See*—
Nakamura, Tohru; Nakazato, Kazuo; Homma, Noriyuki; Sagara, Kazuhiko; Shiba, Takeo; Kure, Tokuo; and Hayashida, Tetsuya, 4,812,894, Cl. 357-55.000.
Saiki, Goro; Kondo, Jiro; Takeda, Koichi; Maki, Mutsuo; and Ooki, Tutomu, to Nippon Steel Corporation. Process for producing ultrafine particles of metals, metal compounds and ceramics and apparatus used therefor. 4,812,166, Cl. 75-0.50C.
Saiki, Yoshiharu: *See*—
Kiya, Nobuyuki; Toriyama, Shuji; and Saiki, Yoshiharu, 4,812,964, Cl. 364-140.000.
Saint, Nathanael: *See*—
Dillner, James M.; and Saint, Nathanael, 4,811,437, Cl. 5-99.00B.
Saischek, Gerald: *See*—
Schermanz, Karl; Saischek, Gerald; Urmann, Robert; and Martetschlager, Kurt, 4,812,465, Cl. 514-340.000.
Saito, Goro: *See*—
Itaya, Hiroshi; and Saito, Goro, 4,812,738, Cl. 324-58.00B.
Saito, Hiroaki: *See*—
Kondo, Hiroki; Saito, Hiroaki; Katsumata, Makoto; and Kinoshita, Michitaka, 4,812,138, Cl. 439-865.000.
Saito, Hiroyoshi: *See*—
Takagi, Syoji; and Saito, Hiroyoshi, 4,812,966, Cl. 364-200.000.
Saito, Masami: *See*—
Fukuda, Tadanori; Sakamoto, Sadayuki; and Saito, Masami, 4,812,032, Cl. 351-159.000.
Saito, Yuichi: *See*—
Takao, Hiroyoshi; Yoshida, Nabuyuki; Imai, Akio; Tsuji, Mitsuji; and Saito, Yuichi, 4,812,527, Cl. 525-250.000.
Saitoh, Keishi; Hirooka, Masaaki; Hanna, Junichi; and Simizu, Isamu, to Canon Kabushiki Kaisha. Method for forming deposited film. 4,812,328, Cl. 427-69.000.
Saitow, Yoshiaki: *See*—
Koba, Keiichiro; Utsunomiya, Taizo; Saitow, Yoshiaki; Iwanaga, Katsusuke; Matsue, Michihiko; and Nishitani, Noriaki, 4,812,271, Cl. 264-63.000.
Saji, Ikutaro: *See*—
Antoku, Fujio; Yoshigi, Mayumi; Saji, Ikutaro; Kojima, Atsuyuki; and Ishizumi, Kukuo, 4,812,461, Cl. 514-278.000.
Sakai, Hideyuki. Process and system for electrodeposition coating. 4,812,211, Cl. 204-180.200.
Sakai, Hiroyuki; Yoshioka, Kazutoshi; Matsumura, Kimiharu; Shigaki, Keisuke; Amemiya, Yutaka; Iimuro, Shunichi; Yoshioka, Haruhiko; and Onoe, Teruhiko, to Tokyo Electron Limited. Method of ashing layers, and apparatus for ashing layers. 4,812,201, Cl. 156-643.000.

Sakai, Kunito: *See*—
Matsuda, Sadamu; Sakai, Kunito; and Takahama, Takashi, 4,812,420, Cl. 437-209.000.
Sakai, Shinji; Kawabata, Takashi; and Miyamoto, Ryosuke, to Canon Kabushiki Kaisha. Stepping motor drive device. 4,812,727, Cl. 318-696.000.
Sakai, Shuzo: *See*—
Mitsuhashi, Masakazu; Sakai, Shuzo; and Miyake, Toshio, 4,812,444, Cl. 514-53.000.
Sakai, Yukio: *See*—
Nojiri, Naohiro; Sakai, Yukio; and Iwakura, Tomoatsu, 4,812,437, Cl. 502-243.000.
Sakamoto, Kazuho; Shitaya, Takao; Kusunoki, Shigeru; Machara, Naoyoshi; Niwa, Takashi; Matsumoto, Takahiro; and Bessyo, Daisuke, to Matsushita Electric Industrial Co., Ltd. Power feeding apparatus. 4,812,960, Cl. 363-20.000.
Sakamoto, Sadayuki: *See*—
Fukuda, Tadanori; Sakamoto, Sadayuki; and Saito, Masami, 4,812,032, Cl. 351-159.000.
Sakamoto, Teruo: *See*—
Hamashima, Yoshio; Minami, Kyoji; Kawata, Kyozo; Sakamoto, Teruo; Takeda, Toyohiko; Suzuki, Yusuke; and Tujikawa, Masanori, 4,812,561, Cl. 540-222.000.
Sakanoue, Kei; Ichijima, Seiji; and Kishimoto, Shinzo, to Fuji Photo Film Co., Ltd. Process for processing silver halide color photographic material containing DIR coupler having a group functioning as a development inhibitor. 4,812,389, Cl. 430-382.000.
Sakashita, Narumi: *See*—
Shimazu, Yukihiko; and Sakashita, Narumi, 4,813,019, Cl. 365-189.000.
Sakata, Haruo, to Clarion Co., Ltd. Tape guide arrangement for a helical scan type magnetic record reproduction device. 4,812,930, Cl. 360-84.000.
Sakito, Yoji: *See*—
Suzukamo, Gohfu; Fukao, Masami; and Sakito, Yoji, 4,812,264, Cl. 260-544.00L.
Sakunaga, Kenichi: *See*—
Terada, Hiromu; Sakunaga, Kenichi; and Fukahori, Naoyuki, 4,812,012, Cl. 350-96.240.
Sakurai, Takayasu: *See*—
Sawada, Kazuhiro; and Sakurai, Takayasu, 4,812,735, Cl. 323-313.000.
Salesky, William J.; and Campbell, Bruce L., to Smith International, Inc. Rock bits and inserts therefor. 4,811,801, Cl. 175-329.000.
Salomon S. A.: *See*—
Barret, Thierry, 4,811,498, Cl. 36-117.000.
Salomon S.A.: *See*—
Barret, Thierry, 4,811,502, Cl. 36-117.000.
Salyer, Paul E., to Othy, Inc. Method of producing an acetabular reamer cup. 4,811,622, Cl. 76-101.00A.
SAMES S.A.: *See*—
Prus, Eric, 4,811,906, Cl. 239-703.000.
Samish, Peter: *See*—
Oppie, Alfred L.; and Samish, Peter, 4,811,702, Cl. 123-188.00M.
Sand, I. Daniel, to Eastman Kodak Company. Anaerobic adhesive compositions. 4,812,495, Cl. 524-37.000.
Sandala, Michael G.: *See*—
Karabin, Richard F.; Niederst, Ken W.; Sandala, Michael G.; and Coleridge, Edward R., 4,812,215, Cl. 204-181.700.
Sandel, Bonnie B.: *See*—
Rothgery, Eugene F.; Hart, William W. C.; Smith, Edward F., III; Phillips, Steven D.; Sandel, Bonnie B.; and Gavin, David F., 4,812,896, Cl. 357-70.000.
Sander, Claus: *See*—
Biederstedt, Lutz; Gerke, Dieter; and Sander, Claus, 4,812,004, Cl. 350-96.200.
Sanders, Robert E., Jr.; Kaanta, Henry W.; McBride, John K.; Milner, Milton W.; Perigo, Terry A.; and Shelby, Samuel L., to Aluminum Company of America. Coated sheet stock. 4,812,183, Cl. 148-439.000.
Sandler, Stanley R.: *See*—
Husain, Altaf; and Sandler, Stanley R., 4,812,596, Cl. 568-788.000.
Sands, Robert L.; and Pennefather, John, to Paracel Holdings Pty. Limited. Recompression chamber. 4,811,729, Cl. 128-202.120.
Sandvik Tobler S.A.: *See*—
Barbieux, Jacques, 4,812,091, Cl. 409-233.000.
Sankyo Kasei Kabushiki Kaisha: *See*—
Yumoto, Tetsuo, 4,812,275, Cl. 264-129.000.
Yumoto, Tetsuo, 4,812,353, Cl. 428-172.000.
Sano, Tomohiko: *See*—
Wakatsuki, Junya; Sano, Tomohiko; and Kurosaki, Tomihiro, 4,812,254, Cl. 252-135.000.
Sanpho America, Inc.: *See*—
Sohma, Yoriko, 4,811,896, Cl. 229-89.000.
Sanraku Incorporated: *See*—
Yoshioka, Takeo; Chida, Noritaka; Watanabe, Azuma; Fukagawa, Yasuo; and Ishikura, Tomoyuki, 4,812,563, Cl. 540-302.000.
Sanshin Kogyo Kabushiki Kaisha: *See*—
Nakahama, Ryoji, 4,811,717, Cl. 123-509.000.
Nakase, Ryoichi; and Nenami, Masayoshi, 4,811,560, Cl. 60-310.000.
Santa Barbara Research Center: *See*—
Brooks, John J., 4,812,072, Cl. 403-24.000.
Santel, Hans-Joachim: *See*—
Schallner, Otto; Gehring, Reinhold; Stetter, Jorg; Santel, Hans-Joachim; Schmidt, Robert R.; Lurssen, Klaus; and Strang, Harry, 4,812,165, Cl. 71-92.000.
Santi, Roberto; Cometti, Giuseppe; and Pagani, Anselmo, to Istituto Guido Donegani, S.p.A.; and Consiglio Nazionale Delle Ricerche. Process for the preparation of the esters of an acid. 4,812,592, Cl. 560-180.000.
Santilli, Domenic: *See*—
Wilson, John C.; Santilli, Domenic; and DeMejo, Lawrence P., 4,812,377, Cl. 430-109.000.
Santy, Michael J.; and Santy, Terence J. Visual fire alert system. 4,812,821, Cl. 340-538.000.
Santy, Terence J.: *See*—
Santy, Michael J.; and Santy, Terence J., 4,812,821, Cl. 340-538.000.
Sanyo Electric Co., Ltd.: *See*—
Nakayama, Yoshinori; and Takizawa, Kikuo, 4,812,287, Cl. 420-41.000.
Tanimoto, Yoshihiro, 4,812,875, Cl. 355-7.000.
Sanyo Electric Ltd.: *See*—
Kuniimitsu, Michio; and Tomita, Hiroshi, 4,812,063, Cl. 400-234.000.
Sappel: *See*—
Robitaille, Thierry, 4,811,600, Cl. 73-272.00R.
Sasada, Taizo: *See*—
Yamawaki, Chiaki; Sasada, Taizo; Iwaki, Tetsuo; and Koyanagi, Katsubumi, 4,812,987, Cl. 364-724.010.
Sasago, Masaru: *See*—
Ogawa, Kazufumi; Sasago, Masaru; Endo, Masayuki; and Ishihara, Takeshi, 4,812,880, Cl. 355-53.000.
Sasaki, Hiroaki: *See*—
Hasegawa, Kazuo; Ohuchi, Junichi; and Sasaki, Hiroaki, 4,812,642, Cl. 250-221.000.
Sasaki, Katsumi: *See*—
Hanazawa, Hideaki; Mori, Makoto; Sasaki, Katsumi; and Inagaki, Katsumi, 4,812,327, Cl. 427-388.400.
Sasaki, Nobukazu: *See*—
Kubota, Atsushi; Sasaki, Nobukazu; Kasamura, Toshirou; Kusumoto, Toshihiko; Shiratori, Tatsuya; Ozawa, Takashi; Yamamoto, Yasuyoshi; Koike, Michiro; Ohashi, Masashi; and Kimura, Akiyoshi, 4,812,874, Cl. 355-7.000.
Sasaki, Shinya, to Hitachi, Ltd. System for amplifying and shaping optical pulses. 4,812,776, Cl. 330-4.300.
Sasaki, Yoshikazu; and Misawa, Naoya, to Minolta Camera Kabushiki Kaisha. Optical laser beam control device for printer. 4,812,861, Cl. 354-4.000.
Sastry, Shankar M.; and Lederich, Richard J., to McDonnell Douglas Corporation. Explosively bonded expanded structure. 4,811,766, Cl. 148-11.50A.
Sato, Hisao. Stapler. 4,811,884, Cl. 227-83.000.
Sato, Nobuyasu: *See*—
Sawano, Hiroyuki; Suzuki, Hideo; Sugawara, Yasuyuki; Kobayashi, Kazunaga; and Sato, Nobuyasu, 4,812,014, Cl. 350-96.290.
Sato, Shichiro. Force multiplier. 4,811,622, Cl. 74-525.000.
Sato, Shigetada, to Asahi Kogaku Kogyo Kabushiki Kaisha. Zoom lens. 4,812,022, Cl. 350-426.000.
Sato, Tomoyoshi: *See*—
Takahashi, Ryoichi; Sato, Tomoyoshi; Tsukamoto, Hidehiko; Morimoto, Kazuo; and Maeda, Nobutaka, 4,811,585, Cl. 72-108.000.
Sato, Toru; Okazaki, Naoto; and Hiyoshi, Katsumi, to Sato, Toru. Preserving solution for blood or packed blood cells and method for preserving blood or packed blood cells by using the same. 4,812,310, Cl. 424-101.000.
Sato, Toshifumi: *See*—
Ide, Motoki; and Sato, Toshifumi, 4,812,813, Cl. 340-311.100.
Sato, Yoshinori: *See*—
Usami, Ikuzo; Sato, Yoshinori; Kurosawa, Yoshitaka; and Morimura, Kazuyuki, 4,811,549, Cl. 53-428.000.
Usami, Ikuzo; Sato, Yoshinori; Kurosawa, Yoshitaka; and Morimura, Kazuyuki, 4,811,838, Cl. 206-219.000.
Sato, Yoshitake; Ohike, Toshio; and Nakazaki, Youji, to Yazaki Corporation. Bimetallic indicator. 4,812,749, Cl. 324-106.000.
Satoh, Takateru; and Shiba, Haruo, to TDK Corporation. Cassette having magnetic tape protected from contaminants. 4,812,936, Cl. 360-132.000.
Satoh, Takuji: *See*—
Yokokura, Takashi; Gemma, Takashi; and Satoh, Takuji, 4,812,042, Cl. 356-348.000.
Satou, Hideaki: *See*—
Ogata, Nobuo; Nakata, Yasuo; Satou, Hideaki; Tanaka, Toshiyuki; Minami, Etsuji; Yoshida, Yoshio; Kurata, Yukio; and Inoue, Teruaki, deceased, 4,812,638, Cl. 250-201.000.
Satterfield, Donald D., to Kimstock, Inc. Spa with an improved air channel and method for constructing same. 4,811,434, Cl. 4-543.000.
Sattrup, Jens E.; and Brondsted, Ole, to Sattrup, Jens Erik. Method of producing a surface sleeve for a plate cylinder for printing purposes. 4,812,219, Cl. 101-375.000.
Sattrup, Jens Erik: *See*—
Sattrup, Jens E.; and Brondsted, Ole, 4,812,219, Cl. 101-375.000.
Saunders, Raymond: *See*—
Marsh, Thomas R.; and Saunders, Raymond, 4,811,926, Cl. 248-488.000.
Saunders, William T.; and Livingston, Warren D., to Weirton Steel Corporation. Composite-coated flat-rolled steel can stock and can product. 4,812,365, Cl. 428-469.000.
Savage, Don H., to Cookie Cup International. Method for preparing a cup-shaped cookie. 4,812,323, Cl. 426-496.000.

Sawa, Hidenori: *See*—
Ito, Akio; Sawa, Hidenori; Sugisaka, Hiroshi; Hayashi, Shigeaki; Nakagawa, Hiroto; Oono, Yasuteru; and Haraguchi, Eiji, 4,812,729, Cl. 318-732.000.

Sawa, Masahiko: *See*—
Kakinuma, Koichiro; Ando, Makoto; Sawa, Masahiko; Ohmuro, Hideaki; Ohryo, Akira; and Nakamura, Tadahiko, 4,812,632, Cl. 235-479.000.

Sawada, Kazuhiro; and Sakurai, Takayasu, to Kabushiki Kaisha Toshiba. Intermediate potential generating circuit. 4,812,735, Cl. 323-313.000.

Sawada, Takanori: *See*—
Akasaka, Akio; Suga, Seiji; and Sawada, Takanori, 4,811,698, Cl. 123-90.170.

Sawano, Hiroyuki; Suzuki, Hideo; Sugawara, Yasuyuki; Kobayashi, Kazunaga; and Sato, Nobuyasu, to Fujikura Ltd. Water penetration-detecting apparatus and optical fiber cable using same. 4,812,014, Cl. 350-96.290.

Sayles, David C., to United States of America, Army. Method of increasing the burning rate enhancement by mechanical accelerators. 4,812,179, Cl. 149-19.200.

Sayles, David C., to United States of America, Army. High intensity yellow smoke and flame flare compositions. 4,812,180, Cl. 149-19.500.

Scaccia, Antonio: *See*—
Tamba, Alberto; Fioravanti, Silverio; and Scaccia, Antonio, 4,812,288, Cl. 420-443.000.

Scan-Optics, Inc.: *See*—
Woods, Daniel E.; Gocht, Ronald E.; Higgins, Peter M.; Edwards, Anne M.; Rowlands, Hugh; Scanlon, Edward F.; and Putzer, Jerry, 4,813,077, Cl. 382-7.000.

Scanlon, Edward F.: *See*—
Woods, Daniel E.; Gocht, Ronald E.; Higgins, Peter M.; Edwards, Anne M.; Rowlands, Hugh; Scanlon, Edward F.; and Putzer, Jerry, 4,813,077, Cl. 382-7.000.

Scaramucci, John P. Needle valve seat. 4,811,929, Cl. 251-122.000.

SCCS, Incorporated: *See*—
Sorenson, Carl C.; and Clausen, Scott W., 4,811,860, Cl. 220-380.000.

Scensny, Patricia M.: *See*—
Babb, Bruce E.; Belly, Robert T.; and Scensny, Patricia M., 4,812,409, Cl. 435-7.000.

Schad, Hanspeter: *See*—
Kaufmann, Meinolph; Kloti, Karl; Nehring, Jurgen; and Schad, Hanspeter, 4,812,635, Cl. 250-231.00R.

Schafer, Ralf: *See*—
Albach, Manfred; Schafer, Ralf; Stormberg, Hans-Peter; and Wegener, Armin, 4,812,736, Cl. 323-224.000.

Schallner, Otto; Gehring, Reinhold; Stetter, Jorg; Santel, Hans-Joachim; Schmidt, Robert R.; Lurssen, Klaus; and Strang, Harry, to Bayer Aktiengesellschaft. Substituted 1-arylpyrazoles, compositions and use. 4,812,165, Cl. 71-92.000.

Scheidemann, Dieter: *See*—
Kallies, Guenter; and Scheidemann, Dieter, 4,811,540, Cl. 52-630.000.

Schellekens, Ronald M. A. M.: *See*—
Mokveld, Floribertus C. H.; and Schellekens, Ronald M. A. M., 4,812,277, Cl. 264-185.000.

Schemmann, Hugo: *See*—
Bertram, Leo; Schemmann, Hugo; and Diefenbach, Gerhard, 4,812,691, Cl. 310-41.000.

Schenck, Robert C.: *See*—
Helferich, Richard L.; and Schenck, Robert C., 4,812,424, Cl. 501-84.000.

Schermanz, Karl; Saischek, Gerald; Urmann, Robert; and Martetschlager, Kurt, to CL Pharma Aktiengesellschaft. Triazole derivatives for use as antimycotic agents. 4,812,465, Cl. 514-340.000.

Scherzer, Dietrich; Zahn, Erwin; and Frank, Wolfram, to BASF Aktiengesellschaft. Process for the preparation of lightweight, planar molded articles. 4,812,368, Cl. 428-332.000.

Scheuble, Bernhard: *See*—
Krause, Joachim; Romer, Michael; Pohl, Ludwig; Scheuble, Bernhard; and Weber, Georg, 4,812,258, Cl. 252-299.610.

Schier, Guenther, to Bayerische Motoren Werke Aktiengesellschaft. Method and apparatus for damping steering movements. 4,811,807, Cl. 180-141.000.

Schirmer, Ulrich: *See*—
Jahn, Dieter; Keil, Michael; Kolassa, Dieter; Schirmer, Ulrich; Wuerzer, Bruno; Meyer, Norbert; Jung, Johann; and Rademacher, Wilhelm, 4,812,160, Cl. 71-88.000.

Schlumberger Systems, Inc.: *See*—
Sloane, Edwin A., 4,813,001, Cl. 364-553.000.

Schlumberger Technology Corporation: *See*—
Liu, Olive Y., 4,813,028, Cl. 367-31.000.

Schmalbein, Klaus-Dieter, to Bruker Analytische Mebtechnik GmbH Silberstreifen. Electron spin resonance spectrometer. 4,812,763, Cl. 324-316.000.

Schmelz, Helmut; Thomann, Helmut; Kuschke, Renate; Wilbert, Eva-Helga; Gajewski, Wolfgang; Sprehe, Josef; Landgraf, Norbert; Ranly, Hans; Balling, Lothar; Reppisch, Richard; and Hein, Dietmar, to Siemens Aktiengesellschaft. Process utilizing catalytic material for the reduction of nitrous oxides. 4,812,296, Cl. 423-239.000.

Schmidt, Dieter: *See*—
Honig, Ernst-August; Kaspar, Lothar; Kalversberg, Manfred; Oberpichler, Gerd; Hagemann, Gottfried; and Schmidt, Dieter, 4,811,631, Cl. 74-762.000.

Schmidt, Donald L.: *See*—
Cadotte, John E.; and Schmidt, Donald L., 4,812,238, Cl. 210-636.000.

Schmidt, Manfred: *See*—
Raats, Herman; Schmidt, Manfred; and Zanner, Johann, 4,811,547, Cl. 53-266.00R.

Schmidt, Randall G.: *See*—
Bell, James P.; and Schmidt, Randall G., 4,812,363, Cl. 428-420.000.

Schmidt, Robert R.: *See*—
Schallner, Otto; Gehring, Reinhold; Stetter, Jorg; Santel, Hans-Joachim; Schmidt, Robert R.; Lurssen, Klaus; and Strang, Harry, 4,812,165, Cl. 71-92.000.

Schmitges, Claus J.: *See*—
Raddatz, Peter; Holzemann, Gunter; Jonczyk, Alfred; Schmitges, Claus J.; and Minck, Klaus O., 4,812,555, Cl. 530-323.000.

Schmitt, Alfred; Stumpp, Gerhard; Trachte, Dietrich; and Wessel, Wolf, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,811,710, Cl. 123-359.000.

Schmitz, Heinz-Gunter; and Konken, Johann, to Supfina Maschinenfabrik Hentzen KG. Apparatus for fine machining of plane surfaces of disk-shaped workpieces having an unmachined bearing side and a slight wall thickness. 4,811,523, Cl. 51-131.100.

Schmitz, Reinold: *See*—
Herzog, Helmut; Schutze, Detlef-Ingo; Schneider, Jurgen; and Schmitz, Reinold, 4,812,568, Cl. 546-49.000.

Schneeberger, Ruedi: *See*—
Busenhart, Peter; Schneeberger, Ruedi; Holbein, Erwin; Wirz, Armin; Flueli, Adolf; and Maier, Hansueli, 4,811,910, Cl. 242-18.00R.

Schneider, Claus: *See*—
Lehr, Erich; Bechtel, Wolf-Dietrich; Boke-Kuhn, Karin; Schneider, Claus; Walther, Gerhard; and Weber, Karl-Heinz, 4,812,453, Cl. 514-255.000.

Schneider, Jurgen: *See*—
Herzog, Helmut; Schutze, Detlef-Ingo; Schneider, Jurgen; and Schmitz, Reinold, 4,812,568, Cl. 546-49.000.

Schneider-Shiley (USA) Inc.: *See*—
Rydell, Mark A., 4,811,737, Cl. 128-344.000.

Schnitker, Mark W.: *See*—
Hill, Guy J.; Smith, Homer G., Jr.; Schnitker, Mark W.; and Beatty, Glenn E., 4,811,800, Cl. 175-323.000.

Schnorr, Peter C.: *See*—
Butts, H. Bruce, Jr.; Cutler, David N.; Schnorr, Peter C.; and Short, Robert T., 4,812,971, Cl. 364-200.000.

Schnur, Rodney C., to Pfizer Inc. Hypoglycemic 5-(isoxazolyl or isothiazolyl)-oxazolidine-2,4-diones. 4,812,471, Cl. 514-372.000.

Schober, Carolee N.: *See*—
Maier, Robert M.; Zmyslowski, Allan J.; and Schober, Carolee N., 4,812,989, Cl. 364-200.000.

Schoeffler, William N.: *See*—
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Schoeps, Jochen: *See*—
Kress, Hans-Jurgen; Lindner, Christian; Grape, Wolfgang; Peters, Horst; Schoeps, Jochen; and Wittmann, Dieter, 4,812,515, Cl. 525-69.000.

Scholz, Thomas H.: *See*—
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Schone, Helmut: *See*—
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Schott Glaswerke: *See*—
Juras, Karl-Heinz, 4,812,152, Cl. 65-120.000.

Schreyer, William M.: *See*—
Albrecht, Lance M.; Pasquini, Mario; and Schreyer, William M., 4,812,963, Cl. 364-131.000.

Schrock, Alan K., to Dow Chemical Company, The. Polyorganosiloxane-bridged bisbenzocyclobutene monomers. 4,812,588, Cl. 556-453.000.

Schroeder, John R.: *See*—
Priddy, Duane B.; and Schroeder, John R., 4,812,514, Cl. 525-67.000.

Schulke, Dwight A.: *See*—
Laughlin, William C.; and Schulke, Dwight A., 4,812,302, Cl. 423-605.000.

Schulter, Alfred: *See*—
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Schulz-Hennig, Jorg: *See*—
Knop, Hans-Georg; and Schulz-Hennig, Jorg, 4,812,913, Cl. 358-285.000.

Schulz, Horst: *See*—
Hefftler, Victor; Johne, Hans; Schulz, Horst; Jentzsch, Arndt; and Schone, Helmut, 4,811,663, Cl. 101-183.000.

Schum, Berthold: *See*—
Hewig, Gerd; Schum, Berthold; and Worner, Jorg, 4,812,416, Cl. 437-5.000.

Schumacher, Josef: *See*—
Hoffmann, Ruediger; Feichtiger, Dieter; Schumacher, Josef; Haller, Peter H.; and Heimbrodt, Klaus-J., 4,811,562, Cl. 60-370.000.

Schuster, Richard L., to Manville Corporation. Sleeve-type carrier handle. 4,811,894, Cl. 229-52.00B.

Schutt, Hans J.: *See*—
Blumberg, Willy; Schutt, Hans J.; Mette, Ulrich; Barbet, Karl H.; Busse, Fritz; and Klier, Benno, 4,812,073, Cl. 403-134.000.

Schutz, Kurt: *See*—
Kunzli, Albert; and Schutz, Kurt, 4,812,618, Cl. 219-288.000.
Kunzli, Albert; and Schutz, Kurt, 4,812,619, Cl. 219-288.000.
Schutze, Detlef-Ingo: *See*—
Herzog, Helmut; Schutze, Detlef-Ingo; Schneider, Jurgen; and Schmitz, Reinold, 4,812,568, Cl. 546-49.000.
Schwalm, Reinhold; and Binder, Horst, to BASF Aktiengesellschaft. Copolymers having o-nitrocarbinol ester groups and preparation thereof. 4,812,542, Cl. 526-265.000.
Schwan, Martin: *See*—
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Schwartz, Leo, to Dorel Industries Inc. Child crib with displaceable and storable side gate. 4,811,436, Cl. 5-93.00R.
Schwarz, Thomas: *See*—
Reinartz, Hans D.; Steffes, Helmut; Maas, Joachim; and Schwarz, Thomas, 4,811,809, Cl. 180-197.000.
Science Research Laboratory, Inc.: *See*—
Klinkowstein, Robert E.; and Shefer, Ruth, 4,812,775, Cl. 328-233.000.
Scientific Development Corporation: *See*—
Bent, Rodney B.; and Casper, Paul W., 4,812,852, Cl. 342-457.000.
Scolastico, Carlo: *See*—
Tinti, Maria O.; Bagolini, Carlo A.; Misiti, Domenico; and Scolastico, Carlo, 4,812,478, Cl. 514-550.000.
Scott, Michael G., to Standard Telephones and Cables, PLC. Metallic-glass coated optical fibres. 4,812,150, Cl. 65-3.110.
Scott, Robert S. Combination hood support, jack crank, lug wrench and wheel cover removal apparatus. 4,811,440, Cl. 7-100.000.
Scripps Clinic and Research Foundation: *See*—
Rideout, Darryl C., 4,812,449, Cl. 514-183.000.
Scripps, Keith A. Detector and light assembly. 4,812,827, Cl. 340-693.000.
Seagate Technology, Inc.: *See*—
Krause, James N., 4,812,928, Cl. 360-78.080.
Seaman, Sharon A.: *See*—
Small, Leonard E.; Garrison, Paul H., Jr.; Winkler, William M.; Seaman, Sharon A.; and Papa, Alyce J., 4,812,253, Cl. 252-132.000.
Sedlmair, Thomas: *See*—
Adam, Peter; Sedlmair, Thomas; and Podlech, Manfred, 4,812,052, Cl. 374-50.000.
See, Jackie R.: *See*—
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See/Shell Biotechnology, Inc.: *See*—
Shell, William E.; and See, Jackie R., 4,811,741, Cl. 128-691.000.
Seebach, Dieter: *See*—
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Yamazaki, Shunpei; Suzuki, Kunio; Kinka, Mikio; Fukada, Takeshi; Abe, Masayoshi; Kobayashi, Ippei; Shibata, Katsuhiko; Susukida, Masato; Nagayama, Susumu; and Koyanagi, Kaoru, 4,812,415, Cl. 437-2.000.
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Ogata, Nobuo; Nakata, Yasuo; Satou, Hideaki; Tanaka, Toshiyuki; Minami, Etsuji; Yoshida, Yoshio; Kurata, Yukio; and Inoue, Teruaki, deceased, 4,812,638, Cl. 250-201.000.
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Hayden, Earl E., 4,812,500, Cl. 524-99.000.
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Shimada, Kazuyuki, to Ricoh Company, Ltd. Optical scanning method. 4,813,046, Cl. 372-38.000.
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Ishihara, Shunichi; Hanna, Junichi; and Shimizu, Isamu, 4,812,325, Cl. 427-69.000.
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Shindou, Yoshio; and Kabeya, Motoo, to Nippon Steel Corporation. Zn-Al hot-dip galvanized steel sheet having improved resistance against secular peeling of coating. 4,812,371, Cl. 428-659.000.
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Shiokawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; Moriya, Koichi; and Baasner, Bernd, to Nihon Tokushu Noyaku Seizo K.K. Nitromethylene derivatives and their use as insecticides. 4,812,454, Cl. 514-256.000.
Shiokawa, Kozo; Tsuboi, Shinichi; Kagabu, Shinzo; and Moriya, Koichi, to Nihon Tokushu Noyaku Seizo K.K. N-(substituted pyridylalkyl) alkylenediamine intermediates for insecticides. 4,812,571, Cl. 546-296.000.
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Shionogi & Co., Ltd.: *See*—
Hamashima, Yoshio; Minami, Kyoji; Kawata, Kyozo; Sakamoto, Teruo; Takeda, Toyohiko; Suzuki, Yusuke; and Tujikawa, Masanori, 4,812,561, Cl. 540-222.000.
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Kubota, Atsushi; Sasaki, Nobukazu; Kasamura, Toshirou; Kusumoto, Toshihiko; Shiratori, Tatsuya; Ozawa, Takashi; Yamamoto, Yasuyoshi; Koike, Michiro; Ohashi, Masashi; and Kimura, Akiyoshi, 4,812,874, Cl. 355-7.000.
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Sie, Swan T.; Drent, Eit; and Jager, Willem W., to Shell Oil Company. Process for the production of methanol and a composition suitable for use as a catalyst in said process. 4,812,433, Cl. 502-117.000.
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Heubeck, Erich; Gunther, Werner; Muther, Manfred; and Werner, Leonhard, 4,813,060, Cl. 378-39.000.
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Simone, Dominic; and Brauer, Melvin, to CasChem, Inc. Hydroxy acid esterified polyols. 4,812,533, Cl. 525-437.000.
Simpson, Danny, to Lear Siegler Seymour Coporation. Storage unit for bed assembly. 4,811,438, Cl. 5-308.000.
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Hebel, James B., 4,811,597, Cl. 73-151.000.
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Smith, Lawrence E.: *See*—
Stephens, Joseph C.; Smith, Lawrence E.; and Boyer, Michael E., 4,812,719, Cl. 315-411.000.
Smith, Lawrence G., to Republic Money Orders, Inc. Apparatus for dispensing money orders. 4,812,986, Cl. 364-479.000.
Smith, Quintin R. Apparatus for forming glass sheets. 4,812,157, Cl. 65-273.000.
Smith, R. Duane, to Black Clawson Company, The. Rider roll relieving system. 4,811,915, Cl. 242-66.000.
Smith, Theoren P., III, to International Business Machines Corporation. Multilayer contact apparatus and method. 4,812,886, Cl. 357-22.000.
Smith, William W., Jr.: *See*—
Rowland, David B.; and Smith, William W., Jr., 4,813,025, Cl. 367-6.000.
SmithKline & French Laboratories, Ltd.: *See*—
Durant, Graham J.; Gribble, Andrew D.; and Slater, Robert A., 4,812,573, Cl. 514-307.000.
Smock Right, Inc.: *See*—
Ethridge, Edwin C.; and Johnson, Jerry L., 4,811,873, Cl. 223-32.000.
SMS Schloemann-Siemag Aktiengesellschaft: *See*—
Benz, Willi; and Eltinger, Walter, 4,811,586, Cl. 72-165.000.
Streubel, Hans; Golla, Rainer; and Kolakowski, Manfred, 4,811,779, Cl. 164-418.000.
Snap-on Tools Corporation: *See*—
Quinn, Robert O., 4,812,768, Cl. 324-379.000.
Snyder, Brian A.: *See*—
Warren, Harold C., III; and Snyder, Brian A., 4,812,414, Cl. 436-533.000.
Snyder, Roy A.: *See*—
Reif, Thomas H.; Warnken, Louis E.; and Snyder, Roy A., 4,811,847, Cl. 206-571.000.
Societe Anonyme: Manzoni-Bouchot: *See*—
Manzoni, Bernard, 4,812,615, Cl. 219-209.000.
Societe Nationale Elf Aquitaine: *See*—
Staron, Philippe; and Gros, Pierre, 4,811,814, Cl. 181-108.000.
Societe Pour L'Application De L'Optique et de L'Electronique a la Recherche et a L'Automatisation Optelec: *See*—
Chappel, Bernard, 4,812,798, Cl. 336-98.000.
Sogell, Hans. Sailboat sail with a full-width, full-depth, horizontally outstanding shield located at an intermediate level. 4,811,678, Cl. 114-103.000.
Sohma, Yoriko, to Sanpho America, Inc. Bottle wrapper. 4,811,896, Cl. 229-89.000.
Sola, Giuseppe, to NECCHI Societa per Azioni. Process for the introduction of chemical-metal elements in metal foundings. 4,811,782, Cl. 164-495.000.
Somers, Edward V.: *See*—
Grimble, Ralph E.; and Somers, Edward V., 4,812,373, Cl. 429-19.000.
Sommer, Gerd R., to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Method for production of envolute gear tooth flanks. 4,811,528, Cl. 51-287.000.
Sonobe, Toshio: *See*—
Narita, Ryoichi; Sonobe, Toshio; Ito, Hitoshi; Ishikawa, Junji; Takenaka, Osamu; and Sugiura, Junji, 4,812,897, Cl. 357-72.000.
Sonoda, Satoshi, to Kioritz Corporation. Fuel supply system for internal combustion engine. 4,811,718, Cl. 123-517.000.
Sony Corporation: *See*—
Fukami, Tadashi; Ozaki, Shinya; and Odaka, Kentaro, 4,812,924, Cl. 360-32.000.
Kakinuma, Koichiro; Ando, Makoto; Sawa, Masahiko; Ohmuro, Hideaki; Ohryo, Akira; and Nakamura, Tadahiko, 4,812,632, Cl. 235-479.000.
Maeda, Satoru, 4,812,998, Cl. 364-518.000.
Mitsuhashi, Takamichi; and Tomioka, Masao, 4,812,921, Cl. 358-343.000.
Nemoto, Tsuneo; and Kaneko, Mika, 4,812,937, Cl. 360-133.000.
Strashun, Leonid, 4,812,125, Cl. 434-224.000.
Yamamoto, Yoshihiro; Kume, Tsutomu; Yamazaki, Nobuo; Hashimoto, Fumiharu; and Ohya, Koichi, 4,812,773, Cl. 328-167.000.
Sopira, Terrence G.: *See*—
Bishop, H. John; Merriss, Morley M.; Ohlsson, Thomas L.; and Sopira, Terrence G., 4,813,035, Cl. 370-50.000.
Sopko, Thomas M.; and Lorentz, Richard E., to Lubrizol Corporation, The. Method of producing polymers of amido-sulfonic acid monomers with high energy agitators. 4,812,544, Cl. 526-73.000.
Sorbie, Charles. Kitchen guillotine. 4,811,642, Cl. 83-574.000.
Sorenson, Carl C.; and Clausen, Scott W., to SCCS, Incorporated. Nestable disposable drinking receptacles. 4,811,860, Cl. 220-380.000.
Sorenson, Wayne: *See*—
Winston, Anthony; Marder, Herman; and Sorenson, Wayne, 4,812,308, Cl. 424-52.000.
Sorg, James F.; and Sorg, Leo L., to J & L Sorg Enterprises, Inc. Energy conservator. 4,811,625, Cl. 74-572.000.
Sorg, Leo L.: *See*—
Sorg, James F.; and Sorg, Leo L., 4,811,625, Cl. 74-572.000.
Sota, Kaoru: *See*—
Watanabe, Yoshiaki; Yokoo, Chihiro; Goi, Masami; Onodera, Akira; Murata, Mitsuo; Fukushima, Hiroshi; and Sota, Kaoru, 4,812,562, Cl. 540-227.000.
Sovak, Mojmir: *See*—
Navratil, Martin; Baytycky, Jimmy P.; Sovak, Mojmir; and Mitchell, Mark, 4,811,787, Cl. 166-273.000.
Spak, Michael E.; Tyl, Craig S.; and Wottrich, Philip C., to Advanced Micro Devices, Inc. Fracturable x-y storage array using a ram cell with bidirectional shift. 4,813,015, Cl. 365-78.000.
Spartan Container Corp.: *See*—
Mead, Gary G.; and Foos, George M., 4,811,853, Cl. 211-124.000.
Spastics Society, The: *See*—
Singleton, John M., 4,811,966, Cl. 280-5.320.

Spatial Systems Pty Limited: *See*—
Hilton, John A., 4,811,608, Cl. 73-862.040.

Spease, Arthur L., to Teleflex Incorporated. Remote control assembly transmission seal. 4,811,621, Cl. 74-501.50R.

Spector, George: *See*—
Brotherton, Tania; and Spector, George, 4,812,621, Cl. 219-366.000.

Spectra-Physics, Inc.: *See*—
Fisher, Charles H.; and DiFaccio, Mark A., 4,813,053, Cl. 372-86.000.

Spectran Corporation: *See*—
Jaeger, Raymond E.; and Aslami, Mohd, 4,812,344, Cl. 428-34.600.

Sprehe, Josef: *See*—
Schmelz, Helmut; Thomann, Helmut; Kuschke, Renate; Wilbert, Eva-Helga; Gajewski, Wolfgang; Sprehe, Josef; Landgraf, Norbert; Ranly, Hans; Balling, Lothar; Reppisch, Richard; and Hein, Dietmar, 4,812,296, Cl. 423-239.000.

Spriggs, Leonard C.: *See*—
Harris, Kendall R.; Spriggs, Leonard C.; and Block, Ralph J., 4,811,529, Cl. 52-396.000.

Sproulle, Richard J.: *See*—
King, Clive G.; Padilla, John A.; and Sproulle, Richard J., 4,811,887, Cl. 228-2.000.

Square D Company: *See*—
Sue, Horace O.; Guttman, Richard T.; Pendley, David M.; and Keys, William C., 4,812,674, Cl. 307-116.000.

SRI International: *See*—
Madou, Marc J.; and Otagawa, Takaaki, 4,812,221, Cl. 204-412.000.
Quinlan, Michael A.; Ramanathan, Ramamurthy; and Wise, Henry, 4,812,300, Cl. 423-404.000.

Srivastava, Gopal K.: *See*—
Hathaway, Roger C.; and Srivastava, Gopal K., 4,812,907, Cl. 358-153.000.

Srivastava, Prem C., to United States of America, Energy. Mercuric acetate phenyl maleimide useful for preparing radiohalogenated maleimides. 4,812,577, Cl. 548-404.000.

Staal, Leendert H.; Vis, Jan C.; and Groeneweg, Jan W., to Unilever Patent Holdings B.V. Metal-oxide-silica adsorbent for bleaching and refining oil. 4,812,436, Cl. 502-407.000.

Stadler, Karl: *See*—
Klam, Rudiger; Muhlberger, Rupert; and Stadler, Karl, 4,812,710, Cl. 313-579.000.

Stahl, Thomas A.: *See*—
Holtz, Roger E.; and Stahl, Thomas A., 4,813,066, Cl. 379-413.000.

Stahle, Gerhard: *See*—
Konig, Herbert; and Stahle, Gerhard, 4,812,993, Cl. 364-470.000.

Stamicarbon B.V.: *See*—
Boesten, Wilhelmus H. J.; and Peters, Peter J. H., 4,812,403, Cl. 435-115.000.
Mokveld, Floribertus C. H.; and Schellekens, Ronald M. A. M., 4,812,277, Cl. 264-185.000.

Stanadyne, Inc.: *See*—
Djordjevic, Ilija; Kelly, William W.; and Vanderpoel, Richard E., 4,811,715, Cl. 123-447.000.

Standard Oil Company, The: *See*—
Kalpakci, Bayram; and Jeans, Yvonne, 4,811,788, Cl. 166-246.000.

Standard Telephones and Cables, PLC: *See*—
Scott, Michael G., 4,812,150, Cl. 65-3.110.

Standplastics (Proprietary) Limited: *See*—
Hill, Edward T., 4,812,282, Cl. 264-540.000.

Stangroom, James E., to ER Fluid Developments Limited. Electrorheological fluids/electric field responsive fluids. 4,812,251, Cl. 252-75.000.

Stanko, Ronald T., to Montefiore Hospital Society of Western Pennsylvania, Inc., The. Method for preventing body fat deposition in mammals. 4,812,479, Cl. 514-557.000.

Stanley, Louis. Motor core with winding slots having reduced air gaps. 4,812,696, Cl. 310-216.000.

Stanley Works, The: *See*—
Remington, John L.; and Seidel, Harry W., 4,811,999, Cl. 312-250.000.

Stapleton, Cecil R., to Westinghouse Electric Corp. Instrumentation port clamps and clamping systems. 4,812,285, Cl. 376-203.000.

Staron, Alain: *See*—
Broussoux, Dominique; Micheron, Francois; Staron, Alain; and Trotel, Jacques, 4,812,647, Cl. 250-227.000.

Staron, Philippe; and Gros, Pierre, to Societe Nationale Elf Aquitaine. Measuring device for a seismic profile within a well-bore. 4,811,814, Cl. 181-108.000.

Staschewski, Harry: *See*—
Ziemek, Gerhard; Staschewski, Harry; and Gunia, Ewald, 4,811,888, Cl. 228-148.000.

Stashko, Daniel R., to GTE Valenite Corporation. End mill cutting tool and indexable insert therefor. 4,812,087, Cl. 407-42.000.

State of Israel, Ministry of Defence, Israel Military Industries, The: *See*—
Levy, Amir; Glickman, Ilan; Berezniak, Haim; and Rosenberg, Avraham, 4,811,664, Cl. 102-226.000.

Stavinoha, Jerome L.; and McCollum, Anthony W., to Eastman Kodak Company. Esters and polyesters from cyclopentadienylethanol and bis(2-hydroxyethyl)dicyclopentadiene. 4,812,509, Cl. 524-484.000.

STC PLC: *See*—
Plumb, Richard G. S., 4,813,054, Cl. 372-96.000.

Ste Look: *See*—
Mercat, Jean-Pierre, 4,811,612, Cl. 73-862.340.

Steadings, Stephen W., to Ryobi Motor Products Corp. Vacuum cleaner with improved auxiliary cleaning. 4,811,450, Cl. 15-337.000.

Stearns, Richard G.: *See*—
Sheridan, Nicholas K.; Stearns, Richard G.; Frank, John A.; Casey, Brendan; and Gary, William, 4,812,860, Cl. 346-159.000.

Steen, Robert A.: *See*—
Hsu, Joseph C.; and Steen, Robert A., 4,812,319, Cl. 426-127.000.

Steeves, Jay M.; and Halbert, Eric H., to Sencorp. Restrictive trigger actuated valve arrangement for a fastener driving tool. 4,811,882, Cl. 227-8.000.

Steffen, Andreas: *See*—
Lauper, Alfred; and Steffen, Andreas, 4,812,771, Cl. 328-109.000.

Steffes, Helmut: *See*—
Reinartz, Hans D.; Steffes, Helmut; Maas, Joachim; and Schwarz, Thomas, 4,811,809, Cl. 180-197.000.

Stefou, Stamatios: *See*—
Perchthaler, Heinz; and Stefou, Stamatios, 4,812,234, Cl. 210-195.300.

Steger, John J.: *See*—
Jacobson, Allan J.; Ho, Teh C.; Chianelli, Russell R.; Steger, John J.; and Montagna, Angelo A., 4,812,227, Cl. 208-215.000.

Steiner, Helmut, to Bergische Achsenfabrik Fr. Kotz & Sohne. Wheel-mounting arrangement with emergency bearing surface. 4,811,992, Cl. 301-105.00R.

Steinman, Gary D. Process for measuring sodium levels in biological fluids. 4,812,400, Cl. 435-21.000.

Stemp, Geoffrey: *See*—
Evans, John M.; Stemp, Geoffrey; and Cassidy, Frederick, 4,812,459, Cl. 514-254.000.

Stephens, Joseph C.; Smith, Lawrence E.; and Boyer, Michael E., to Thomson Consumer Electronics, Inc. High voltage regulator in a television apparatus. 4,812,719, Cl. 315-411.000.

Sterman, Saul C., to Med Optics Corp. Method for tinting contact lenses. 4,811,662, Cl. 101-170.000.

Sternlieb, Herschel, to W.S. Libbey Co. Two face stitch bonded fabric. 4,811,573, Cl. 66-193.000.

Stetter, Jorg: *See*—
Schallner, Otto; Gehring, Reinhold; Stetter, Jorg; Santel, Hans-Joachim; Schmidt, Robert R.; Lurssen, Klaus; and Strang, Harry, 4,812,165, Cl. 71-92.000.

Stevens, Robert C., to Cordis Corporation. Catheter guidewire. 4,811,743, Cl. 128-772.000.

Stevens, Robert E.; and Roudebush, Dennis A., to Curtis Dyna-Products Corporation. Pulse fog generator. 4,811,901, Cl. 239-138.000.

Stewart, Alexander; Furness, Duncan S.; and Bhatia, Sham P., to Rodime PLC. Head positioning mechanism for rotating disk data storage system. 4,812,929, Cl. 360-77.070.

Stewart, Bradley C.: *See*—
Stewart, John L.; and Stewart, Bradley C., 4,812,847, Cl. 341-154.000.

Stewart Hughes Limited: *See*—
Talbot, Richard, 4,812,643, Cl. 250-222.100.

Stewart, John L.; and Stewart, Bradley C. Parallel port pass-through digital to analog converter. 4,812,847, Cl. 341-154.000.

Stewart, Leo J., to Motion Design Creations Inc. Foil arrangement for water-borne craft. 4,811,674, Cl. 114-39.200.

Stober, Reinhard; Fischer, Wolfgang; Huss, Michael; and Udluft, Klaus, to Degussa Aktiengesellschaft. Process for dry cationization of starch. 4,812,257, Cl. 252-182.320.

Stolowitz, Mark L., to Bio-Affinity Systems, Inc. Solid phase N-hydroxysuccinimide reagents. 4,812,362, Cl. 428-407.000.

Stolowitz, Mark L., to Bio-Affinity Systems, Inc. Solid phase oxime reagent. 4,812,532, Cl. 525-420.000.

Storace, Anthony; and Gasiunas, Donatas, to Pitney Bowes Inc. Postage meter communication system. 4,812,992, Cl. 364-464.020.

Storage Technology Corporation: *See*—
Fechner, Jimmy R., 4,812,927, Cl. 360-75.000.

Stork PMT B.V.: *See*—
v.d. Nieuwelaar, Josephus A.; and Janssen, Petrus C. M., 4,811,458, Cl. 17-11.10R.

Stormberg, Hans-Peter: *See*—
Albach, Manfred; Schafer, Ralf; Stormberg, Hans-Peter; and Wegener, Armin, 4,812,736, Cl. 323-224.000.

Story, James M.; and Sklad, Matthew P., to Aluminum Company of America. Strain rate control of superplastic forming. 4,811,582, Cl. 72-16.000.

Stowe, Lawrence R.: *See*—
Jennings, Alfred R., Jr.; and Stowe, Lawrence R., 4,811,790, Cl. 166-278.000.

Stowell, Dennis E. Baler-mounted continuous moisture monitoring system. 4,812,741, Cl. 324-65.00P.

Strada, Antonio. Thermostatically controlled electric immersion heater for aquariums. 4,812,626, Cl. 219-523.000.

Strang, Harry: *See*—
Schallner, Otto; Gehring, Reinhold; Stetter, Jorg; Santel, Hans-Joachim; Schmidt, Robert R.; Lurssen, Klaus; and Strang, Harry, 4,812,165, Cl. 71-92.000.

Strashun, Leonid, to Sony Corporation. Interactive teaching apparatus. 4,812,125, Cl. 434-224.000.

Stratton, Paul E., Jr.: *See*—
Blackwell, David L.; and Stratton, Paul E., Jr., 4,811,648, Cl. 89-14.300.

Stream Industrial Systems Inc.: *See*—
Kopernicky, Jaroslav, 4,812,086, Cl. 406-153.000.

Streubel, Hans; Golla, Rainer; and Kolakowski, Manfred, to SMS Schloemann-Siemag Aktiengesellschaft. Mold for the continuous casting of steel strip. 4,811,779, Cl. 164-418.000.

Stribiak, John J., to Precision Carbide Tool Co., Inc. Protective deployment apparatus for rotary cutting tools. 4,811,843, Cl. 206-349.000.

Stride Tool Inc., a New York Corporation: *See*—
Potesta, Richard E., 4,811,441, Cl. 7-158.000.

Strike, Donald P.: *See*—
Commons, Thomas J.; Mewshaw, Richard E.; and Strike, Donald P., 4,812,583, Cl. 549-292.000.

Stritzke, Bernard G.; and Rericha, Brian F., to Microdot Inc. Fixed valve stem oil seal. 4,811,960, Cl. 277-153.000.

Stritzke, Bernard G.: *See*—
Rericha, Brian F.; and Stritzke, Bernard G., 4,811,703, Cl. 123-188.00P.

Strobel, Klaus: *See*—
Pohlmann, Hans-Jurgen; and Strobel, Klaus, 4,812,434, Cl. 502-178.000.

Stromberg, Gary D.: *See*—
Cochran, Gary L.; Seeley, Ronald D.; Shelton, Donald G.; and Stromberg, Gary D., 4,812,103, Cl. 414-723.000.

Stubbs, David D., to Tektronix, Inc. Signal viewing instrumentation control system. 4,812,996, Cl. 364-487.000.

Stumpp, Gerhard; and Wessel, Wolf, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,811,711, Cl. 123-359.000.

Stumpp, Gerhard: *See*—
Schmitt, Alfred; Stumpp, Gerhard; Trachte, Dietrich; and Wessel, Wolf, 4,811,710, Cl. 123-359.000.

Su, Tien-Kuei, to Mobil Oil Corporation. Compositions and extruded articles compromising polyolefin, polyamide and fatty acid amide. 4,812,504, Cl. 524-229.000.

Suda, Yasuo: *See*—
Akashi, Akira; Ishizaki, Akira; Suda, Yasuo; Ohnuki, Ichiro; Ohtaka, Keiji; and Koyama, Takeshi, 4,812,869, Cl. 354-408.000.

Sudo, Ryoichi; Miwa, Hiroaki; and Tajima, Tetsuo, to Hitachi Ltd.; and Hitachi Maxwell Ltd. Optical disc base plate and process for producing the same. 4,812,346, Cl. 428-65.000.

Sue, Horace O.; Guttman, Richard T.; Pendley, David M.; and Keys, William C., to Square D Company. Safety gate limit switch using Hall effect transducer. 4,812,674, Cl. 307-116.000.

Suenaga, Toshihiko: *See*—
Inagaki, Hiromi; Matsuura, Kazuo; Koike, Tetsuya; Suenaga, Toshihiko; Yorita, Masaru; and Izawa, Masaki, 4,811,933, Cl. 267-140.100.

Suga, Seiji: *See*—
Akasaka, Akio; Suga, Seiji; and Sawada, Takanori, 4,811,698, Cl. 123-90.170.

Suganami, Takuya: *See*—
Furuishi, Yoshiro; Suganami, Takuya; and Fujiwara, Michio, 4,811,563, Cl. 60-517.000.

Sugawara, Jun: *See*—
Okada, Yoshikazu; Sugawara, Jun; and Takizawa, Sumiyoshi, 4,812,370, Cl. 428-552.000.

Sugawara, Yasuyuki: *See*—
Sawano, Hiroyuki; Suzuki, Hideo; Sugawara, Yasuyuki; Kobayashi, Kazunaga; and Sato, Nobuyasu, 4,812,014, Cl. 350-96.290.

Sugi, Nobuo: *See*—
Shigehara, Hiroshi; Shiraishi, Mikio; Watanabe, Yasuhiro; and Sugi, Nobuo, 4,813,008, Cl. 364-760.000.

Sugimoto, Koyata: *See*—
Hasegawa, Hiroaki; Miyata, Yasuji; Sugimoto, Koyata; and Nakamura, Akira, 4,811,606, Cl. 73-861.380.

Sugimoto, Mamoru: *See*—
Ueda, Hiroshi; and Sugimoto, Mamoru, 4,811,490, Cl. 33-179.50R.

Sugimura, You; Numa, Nobushige; Watanabe, Tadashi; Sugiyama, Yutaka; Ohira, Kazuhiko; and Yamaguchi, Sachio, to Kansai Paint Company, Limited. Metallic coating method. 4,812,337, Cl. 427-407.100.

Sugisaka, Hiroshi: *See*—
Ito, Akio; Sawa, Hidenori; Sugisaka, Hiroshi; Hayashi, Shigeaki; Nakagawa, Hiroto; Oono, Yasuteru; and Haraguchi, Eiji, 4,812,729, Cl. 318-732.000.

Sugiura, Junji: *See*—
Narita, Ryoichi; Sonobe, Toshio; Ito, Hitoshi; Ishikawa, Junji; Takenaka, Osamu; and Sugiura, Junji, 4,812,897, Cl. 357-72.000.

Sugiyama, Mizuho, to Toyota Jidosha Kabushiki Kaisha. Apparatus for controlling a steering angle of a rear wheel. 4,811,969, Cl. 280-701.000.

Sugiyama, Takeo; and Hiraishi, Shigetoshi, to Mitsubishi Paper Mills, Ltd. Color image recording material. 4,812,354, Cl. 428-195.000.

Sugiyama, Yutaka, to Nihon Biso Kabushiki Kaisha. Device for horizontally moving an apparatus working at a high location. 4,811,819, Cl. 182-37.000.

Sugiyama, Yutaka: *See*—
Sugimura, You; Numa, Nobushige; Watanabe, Tadashi; Sugiyama, Yutaka; Ohira, Kazuhiko; and Yamaguchi, Sachio, 4,812,337, Cl. 427-407.100.

Sulzer Brothers Limited: *See*—
Bucher, Robert; and Lincke, Paul, 4,811,762, Cl. 139-452.000.
Ehrsam, Christian, 4,812,236, Cl. 210-490.000.
Kunzli, Albert; and Schutz, Kurt, 4,812,618, Cl. 219-288.000.
Kunzli, Albert; and Schutz, Kurt, 4,812,619, Cl. 219-288.000.

Sumerau, William R., to Ryobi Motor Products Corp. Auxiliary attachment adaptor and vacuum cleaner for use therewith. 4,811,452, Cl. 15-337.000.

Sumida, Joe T.: *See*—
Davarian, Faramaz; and Sumida, Joe T., 4,812,786, Cl. 332-16.00R.

Sumihiro, Naotaka, to NEC Corporation. Electronically programmable and erasable memory device having floating gate electrode with a unique distribution of impurity concentration. 4,812,898, Cl. 357-23.500.

Sumitomo Chemical Co.: *See*—
Tatsukami, Yoshiharu; Doi, Toshiki; and Oka, Masahiko, 4,812,011, Cl. 350-96.340.

Sumitomo Chemical Company, Limited: *See*—
Imai, Shozaburo; Isobe, Michihisa; Yokoo, Kazuhiro; and Matsuura, Hideaki, 4,812,345, Cl. 428-65.000.
Kondo, Michitada; Minai, Masayoshi; Kai, Seiichi; Higashii, Takayuki; and Ueda, Yuji, 4,812,585, Cl. 549-483.000.
Nagasaki, Hideo; Yachigo, Shinichi; Ishii, Tamaki; Yoshimura, Masakatsu; Takahashi, Yukoh; and Yamamoto, Hiroki, 4,812,494, Cl. 524-91.000.
Oi, Fumio; Osaki, Haruyoshi; Furuta, Akihiro; Uemura, Yukikazu; Ninomiya, Takao; Uetani, Yasunori; and Hanabata, Makoto, 4,812,551, Cl. 528-129.000.
Omura, Takashi; and Yokogawa, Kazufumi, 4,812,558, Cl. 534-618.000.
Suzukamo, Gohfu; Fukao, Masami; and Sakito, Yoji, 4,812,264, Cl. 260-544.00L.
Takao, Hiroyoshi; Yoshida, Nabuyuki; Imai, Akio; Tsuji, Mitsuji; and Saito, Yuichi, 4,812,527, Cl. 525-250.000.

Sumitomo Electric Industries, Ltd.: *See*—
Kyoto, Michihisa; Yoshioka, Naoki; Tanaka, Gotaro; Kanamori, Hiroo; Watanabe, Minoru; and Nakahara, Motohiro, 4,812,155, Cl. 65-3.120.
Miyake, Shinichi; and Miyasaka, Shinji, 4,812,392, Cl. 435-3.000.
Osaka, Keiji; Yanagi, Toru; and Asano, Yasuo, 4,812,010, Cl. 350-96.220.
Tokumaru, Yuzo; and Nishi, Osamu, 4,812,008, Cl. 350-96.210.
Ueda, Hiroshi; and Sugimoto, Mamoru, 4,811,490, Cl. 33-179.50R.
Yoshida, Kiminobu; Shiomi, Akio; and Watanabe, Kazuhisa, 4,812,154, Cl. 65-3.110.

Sumitomo Heavy Industries, Ltd.: *See*—
Asano, Koji; and Okawa, Masao, 4,811,834, Cl. 198-621.000.

Sumitomo Metal Industries, Ltd.: *See*—
Maehara, Yasuhiro; and Tarutani, Yoshio, 4,812,177, Cl. 148-12.0EA.

Sumitomo Pharmaceuticals Company, Limited: *See*—
Antoku, Fujio; Yoshigi, Mayumi; Saji, Ikutaro; Kojima, Atsuyuki; and Ishizumi, Kukuo, 4,812,461, Cl. 514-278.000.

Sumitomo Rubber Industries, Ltd.: *See*—
Takao, Hiroyoshi; Yoshida, Nabuyuki; Imai, Akio; Tsuji, Mitsuji; and Saito, Yuichi, 4,812,527, Cl. 525-250.000.

Summers, Harry: *See*—
Old, John L.; and Summers, Harry, 4,811,620, Cl. 74-474.000.

Sun, Shin-Ching, Apparatus for preventing criminal's escape or violence. 4,811,775, Cl. 70-16.000.

Sundberg, Esa: *See*—
Aalto, Erkki; Korhonen, Kaarlo; Pekkinen, Jorma; Sundberg, Esa; Tolmunen, Arvi; Vartiainen, Seppo; and Villikka, Reijo, 4,811,724, Cl. 126-299.00D.

Sundstrand Corp.: *See*—
Jones, Gregory D.; Owens, William R.; Thiel, Clifford G.; and Danby, Clive M., 4,812,943, Cl. 361-92.000.

Sundstrand Data Control, Inc.: *See*—
Hulsing, Rand H., 4,811,602, Cl. 73-505.000.
Hulsing, Rand H., II, 4,812,977, Cl. 364-422.000.

Supfina Maschinenfabrik Hentzen KG: *See*—
Schmitz, Heinz-Gunter; and Konken, Johann, 4,811,523, Cl. 51-131.100.

Susaki, Wataru: *See*—
Shima, Akihiro; and Susaki, Wataru, 4,813,050, Cl. 372-45.000.

Susukida, Masato: *See*—
Yamazaki, Shunpei; Suzuki, Kunio; Kinka, Mikio; Fukada, Takeshi; Abe, Masayoshi; Kobayashi, Ippei; Shibata, Katsuhiko; Susukida, Masato; Nagayama, Susumu; and Koyanagi, Kaoru, 4,812,415, Cl. 437-2.000.

Suwala, David W., to GAF Corporation. Paint removing compositions. 4,812,255, Cl. 252-142.000.

Suyama, Koji; and Yoshida, Akiyoshi, to Hoshizaki Electric Co., Ltd. Dishwasher. 4,811,997, Cl. 312-228.000.

Suzukamo, Gohfu; Fukao, Masami; and Sakito, Yoji, to Sumitomo Chemical Company, Limited. Method for racemization of optically active chrysanthemic acid derivatives. 4,812,264, Cl. 260-544.00L.

Suzuki, Hideo: *See*—
Sawano, Hiroyuki; Suzuki, Hideo; Sugawara, Yasuyuki; Kobayashi, Kazunaga; and Sato, Nobuyasu, 4,812,014, Cl. 350-96.290.

Suzuki, Hiroshi, to Tokico Ltd. Electrical robot. 4,812,104, Cl. 414-735.000.

Suzuki, Kazuhiro: *See*—
Yamane, Kazuo; Mori, Masakazu; Tsuda, Takashi; Ohkuma, Yoshinori; and Suzuki, Kazuhiro, 4,813,048, Cl. 372-38.000.

Suzuki, Kenji, to Fuji Photo Film Co., Ltd. Automatic photographic printing apparatus with simulator and method of adjusting simulator of automatic photographic printing apparatus. 4,812,879, Cl. 355-38.000.

Suzuki, Kunio: *See*—
Yamazaki, Shunpei; Suzuki, Kunio; Kinka, Mikio; Fukada, Takeshi; Abe, Masayoshi; Kobayashi, Ippei; Shibata, Katsuhiko; Susukida, Masato; Nagayama, Susumu; and Koyanagi, Kaoru, 4,812,415, Cl. 437-2.000.

Suzuki, Masami; Nishida, Hiroshi; Suzuki, Tomio; Kawamura, Katsumi; and Takahashi, Tsuyoshi, to Hitachi, Ltd. Actuator for memory storage device. 4,812,934, Cl. 360-106.000.

Suzuki, Shigeru, to Ricoh Company, Ltd. Device for reducing document in size having two facing non-parallel mirrors. 4,812,917, Cl. 358-293.000.

Suzuki, Tameyuki; Yasukawa, Junichi; Nomura, Toyokazu; Toda, Kazuo; Kamakura, Takuro; and Ota, Toshiaki, to Shinto Paint Co., Ltd. Method of forming functional films on fine transparent electric conductive circuit pattern and spaces thereof. 4,812,387, Cl. 430-311.000.

Suzuki, Tomio: *See*—
Suzuki, Masami; Nishida, Hiroshi; Suzuki, Tomio; Kawamura, Katsumi; and Takahashi, Tsuyoshi, 4,812,934, Cl. 360-106.000.

Suzuki, Yasuhiro: *See*—
Tanoshima, Katsuhide; Suzuki, Yasuhiro; Nagata, Shizuo; and Shimizu, Yasuo, 4,813,007, Cl. 346-74.500.

Suzuki, Yusuke: *See*—
Hamashima, Yoshio; Minami, Kyoji; Kawata, Kyozo; Sakamoto, Teruo; Takeda, Toyohiko; Suzuki, Yusuke; and Tujikawa, Masanori, 4,812,561, Cl. 540-222.000.

Svennerholm, Bo: *See*—
Vahlne, Anders; Svennerholm, Bo; Rymo, Lars; Jeansson, Stig; and Horal, Peter, 4,812,556, Cl. 530-324.000.

Swackhammer, William: *See*—
Dimond, James; and Swackhammer, William, 4,812,212, Cl. 204-147.000.

Swanson, Claude V. Apparatus and method for using microwave radiation to measure water content of a fluid. 4,812,739, Cl. 324-58.50A.

Swift, Allan W.; and Venable, Frank, to E. J. Brooks Company. Labeled security seal. 4,811,977, Cl. 292-307.00A.

Swiss Aluminium Ltd.: *See*—
Merz, Walter, 4,812,085, Cl. 406-88.000.

Sylvester, Robert D., Jr.; Horn, Paul C.; and Bober, Vincent J., to GFS Manufacturing Company, Inc. Method of winding toroid transformers. 4,811,477, Cl. 29-605.000.

Syntex (U.S.A.) Inc.: *See*—
Tarnowski, Thomas L.; Lin, Cheng-I; and Ullman, Edwin F., 4,812,401, Cl. 435-29.000.

Synthelabo: *See*—
Comarmond, Jacques; Purcell, Thomas; and Zard, Lydia, 4,812,467, Cl. 514-341.000.

Tachi-S Co. Ltd.: *See*—
Fujita, Yasuyuki; and Nishino, Takaichi, 4,811,925, Cl. 248-430.000.

Tada, Kaoru, to Minolta Camera Kabushiki Kaisha. Image reading apparatus which eliminates moire patterns by magnifying an image optically and reducing it electrically. 4,812,915, Cl. 358-287.000.

Tada, Tetsuo: *See*—
Maeno, Hideshi; and Tada, Tetsuo, 4,813,043, Cl. 371-27.000.

Taga Electric Co., Ltd.: *See*—
Mishiro, Shoji, 4,812,697, Cl. 310-323.000.

Taguchi, Masahiro: *See*—
Tashiro, Syuzaburou; Ina, Toshikazu; Nakano, Osamu; Taguchi, Masahiro; Onimaru, Sadahisa; and Kuno, Akira, 4,812,838, Cl. 340-825.060.

Taisho Pharmaceutical Co., Ltd.: *See*—
Watanabe, Yoshiaki; Yokoo, Chihiro; Goi, Masami; Onodera, Akira; Murata, Mitsuo; Fukushima, Hiroshi; and Sota, Kaoru, 4,812,562, Cl. 540-227.000.

Tajima, Takeharu: *See*—
Hishinuma, Toshio; Katsuta, Atsushi; and Tajima, Takeharu, 4,812,932, Cl. 360-97.010.

Tajima, Tetsuo: *See*—
Sudo, Ryoichi; Miwa, Hiroaki; and Tajima, Tetsuo, 4,812,346, Cl. 428-65.000.

Takada, Juichiro. Emergency locking seat belt retractor with automatic locking mechanism. 4,811,912, Cl. 242-107.40B.

Takae, Masaki: *See*—
Kuwajima, Teruaki; Uenoyama, Kazuo; Takae, Masaki; and Okuda, Hidefumi, 4,812,335, Cl. 427-407.100.

Takagi, Katsuaki; Aoki, Hirokazu; Nakagawa, Norio; and Hagiwara, Yoshimune, to Hitachi, Ltd. Address translation unit. 4,812,969, Cl. 364-200.000.

Takagi, Syoji; and Saito, Hiroyoshi, to Kabushiki Kaisha Toshiba. Word block searcher for word processing equipment and searching method therefor. 4,812,966, Cl. 364-200.000.

Takagi, Touichi; Ametani, Kohei; and Shimizu, Kouichi, to Denki Kagaku Kogyo Kabushiki Kaisha. Lead-containing oxide powder. 4,812,426, Cl. 501-136.000.

Takahama, Takashi: *See*—
Matsuda, Sadamu; Sakai, Kunito; and Takahama, Takashi, 4,812,420, Cl. 437-209.000.

Takahashi, Kazuyuki; Oe, Yasuhiro; and Yamamoto, Etushi, to Ryobi Ltd. Motor-driven chain saw braking/locking apparatus. 4,811,487, Cl. 30-382.000.

Takahashi, Koji: *See*—
Nagashima, Yoshitake; Ishikawa, Hisashi; Kozuki, Susumu; Yoshimura, Katsuji; Takahashi, Koji; and Nagasawa, Kenichi, 4,812,920, Cl. 358-310.000.

Takahashi, Masanobu: *See*—
Endo, Kazuyuki; Taniguchi, Motoaki; Yamada, Shigeki; Takahashi, Masanobu; and Kato, Kenshiro, 4,811,773, Cl. 152-543.000.

Takahashi, Ryoichi; Sato, Tomoyoshi; Tsukamoto, Hidehiko; Morimoto, Kazuo; and Maeda, Nobutaka, to Nissan Motor Co., Ltd.; and Mitsubishi Jukogyo Kabushiki Kaisha. Device for forming asymmetrical articles by rolling. 4,811,585, Cl. 72-108.000.

Takahashi, Satomi; Yamada, Yukio; Ueda, Yasuyoshi; Katayama, Yasuhiro; Shimada, Yoshio; and Watanabe, Kiyoshi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for preparing optically active hydantoins. 4,812,406, Cl. 435-280.000.

Takahashi, Takuji: *See*—
Kohtoku, Yasuhiko; Kunisawa, Teturo; and Takahashi, Takuji, 4,812,298, Cl. 423-327.000.

Takahashi, Tsuyoshi: *See*—
Suzuki, Masami; Nishida, Hiroshi; Suzuki, Tomio; Kawamura, Katsumi; and Takahashi, Tsuyoshi, 4,812,934, Cl. 360-106.000.

Takahashi, Yukoh: *See*—
Nagasaki, Hideo; Yachigo, Shinichi; Ishii, Tamaki; Yoshimura, Masakatsu; Takahashi, Yukoh; and Yamamoto, Hiroki, 4,812,494, Cl. 524-91.000.

Takak, Fumimaro; Urabe, Akio; Shimamura, Michiya; and Mizuno, Masao, to Kuraray Co., Ltd. Methods for enhancing differentiation and proliferation of hematopoietic progenitor cells. 4,812,443, Cl. 514-143.000.

Takao, Hiroyoshi; Yoshida, Nabuyuki; Imai, Akio; Tsuji, Mitsuji; and Saito, Yuichi, to Sumitomo Chemical Company, Limited; and Sumitomo Rubber Industries, Ltd. Rubber composition for tire treads containing dicarboxylic acid diester coupled block polymers. 4,812,527, Cl. 525-250.000.

Takase, Akihiko, to Hitachi, Ltd. FSK signal demodulator. 4,813,058, Cl. 375-82.000.

Takashima, Yutaka; Tsuyuki, Mikio; and Seto, Izumi, to Fuji Photo Film Co., Ltd. Film cassette opener for unloading a film from a film cassette and for loading a film in the film cassette. 4,811,546, Cl. 53-266.00R.

Takatsuka, Masanori; and Hariguchi, Yoshinori, to Yamaha Corporation. Vibration absorber for a racket. 4,811,947, Cl. 273-73.00J.

Takayama, Sui, to Nippon Gear Co., Ltd.; and Atsugi Machinery Co., Ltd. Motion conversion mechanism. 4,811,618, Cl. 74-89.150.

Takayanagi, Yasuyuki: *See*—
Doi, Shunichi; and Takayanagi, Yasuyuki, 4,812,579, Cl. 548-548.000.

Takeda Chemical Industries: *See*—
Yasushi, Mikura; Kensuke, Asada; and Hajime, Toguchi, 4,812,557, Cl. 530-351.000.

Takeda Chemical Industries, Ltd.: *See*—
Meguro, Kanji; Fujita, Takeshi; Hatanaka, Chitoshi; and Goi, Satoru, 4,812,570, Cl. 546-280.000.

Takeda, Koichi: *See*—
Saiki, Goro; Kondo, Jiro; Takeda, Koichi; Maki, Mutsuo; and Ooki, Tutomu, 4,812,166, Cl. 75-0.50C.

Takeda, Masatoshi; Ikeda, Kazuo; Tominaga, Yoshiharu; and Mori, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Harmonic suppressing device. 4,812,669, Cl. 307-105.000.

Takeda, Toyohiko: *See*—
Hamashima, Yoshio; Minami, Kyoji; Kawata, Kyozo; Sakamoto, Teruo; Takeda, Toyohiko; Suzuki, Yusuke; and Tujikawa, Masanori, 4,812,561, Cl. 540-222.000.

Takeda, Yukimasa; and Wakatuki, Yuji, to Hoshizaki Electric Co., Ltd. Apparatus for defrosting frozen articles. 4,812,622, Cl. 219-400.000.

Takemoto, Fumio; Kunishige, Tuneo; and Ochi, Mitsutoshi, to Mitsubishi Rayon Co., Ltd. Acrylic fiber having Y-type section and process for producing the same. 4,812,361, Cl. 428-397.000.

Takenaga, Hideo, to Olympus Optical Co., Ltd. Dictation display for displaying present position and cue mark position information. 4,812,940, Cl. 360-137.000.

Takenaka, Osamu: *See*—
Narita, Ryoichi; Sonobe, Toshio; Ito, Hitoshi; Ishikawa, Junji; Takenaka, Osamu; and Sugiura, Junji, 4,812,897, Cl. 357-72.000.

Takenouchi, Mariko: *See*—
Fujiwara, Akie; Takenouchi, Mariko; and Shimizu, Masahiro, 4,813,078, Cl. 382-21.000.

Taketomi, Susumu. Optical apparatus using anomalously strong magneto-birefringence of magnetic fluid. 4,812,767, Cl. 324-244.000.

Takeuchi, Akihiro: *See*—
Honjo, Masahiro; Takeuchi, Akihiro; Ochi, Atsuo; Aki, Shinichi; Nakagawa, Yukio; and Kobayashi, Masaaki, 4,812,783, Cl. 331-20.000.

Takeuchi, Atsushi: *See*—
Kawashima, Hiromi; and Takeuchi, Atsushi, 4,812,680, Cl. 307-350.000.

Takeuchi, Masaharu: *See*—
Nishibe, Yuji; Nonomura, Yutaka; and Takeuchi, Masaharu, 4,811,609, Cl. 73-862.360.

Takeuji, Koichi; and Furusawa, Takashi, to Sharp Kabushiki Kaisha. Cooling system for cooling electrical parts for microwave oven. 4,812,617, Cl. 219-10.55R.

Takeya, Ryuko: *See*—
Kuwano, Eiichi; Takeya, Ryuko; Eto, Morifusa; and Asano, Shoji, 4,812,473, Cl. 514-396.000.

Taki, Kazunari, to Brother Kogyo Kabushiki Kaisha. Optical disc head with high signal-to-noise ratio. 4,812,637, Cl. 250-201.000.

Takigawa, Kouichi: *See*—
Kakuta, Yonehiro; Takigawa, Kouichi; Noji, Akio; Kuwabara, Shigeaki; Shimada, Tadashi; and Iida, Michihiro, 4,811,492, Cl. 33-366.000.

Takizawa, Kikuo: *See*—
Nakayama, Yoshinori; and Takizawa, Kikuo, 4,812,287, Cl. 420-41.000.

Takizawa, Shozo: *See*—
Yoshida, Yasuhiko; Honda, Masahiro; and Takizawa, Shozo, 4,811,805, Cl. 180-140.000.
Takizawa, Sumiyoshi: *See*—
Okada, Yoshikazu; Sugawara, Jun; and Takizawa, Sumiyoshi, 4,812,370, Cl. 428-552.000.
Talbot, Richard, to Stewart Hughes Limited. Detector device for a blade tracking system having two sensors. 4,812,643, Cl. 250-222.100.
Tallman, James L., to Tektronix, Inc. Method and apparatus for determining internal status of a processor. 4,813,009, Cl. 364-900.000.
Tamba, Alberto; Fioravanti, Silverio; and Scaccia, Antonio, to Centro Sviluppo Materiali S.p.A. Non precious nickel based chromium containing alloy for dental prostheses. 4,812,288, Cl. 420-443.000.
Tamura, Kimichi; Kawada, Susumu; Sekine, Yoshitada; Abe, Kazuyoshi; Ishikawa, Ryosuke; and Yokota, Fumiki, to Nissan Motor Co., Ltd. Machine for holding workpiece. 4,811,935, Cl. 269-34.000.
Tamura, Yutaka: *See*—
Iwamoto, Hiroshi; Tamura, Yutaka; Mizuno, Yuji; and Yokota, Akihiro, 4,812,916, Cl. 358-289.000.
Tanagawa, Kouzi: *See*—
Ohta, Satoshi; Tanagawa, Kouzi; Yamamoto, Hideo; and Kumagai, Keiji, 4,812,634, Cl. 235-492.000.
Tanaka, Gotaro: *See*—
Kyoto, Michihisa; Yoshioka, Naoki; Tanaka, Gotaro; Kanamori, Hiroo; Watanabe, Minoru; and Nakahara, Motohiro, 4,812,155, Cl. 65-3.120.
Tanaka, Koichi: *See*—
Nakae, Yoshio; Kinoshita, Akiyo; and Tanaka, Koichi, 4,811,521, Cl. 51-5.00D.
Tanaka, Nobuo; Tominaga, Satoshi; Okada, Hisao; and Yoshida, Toshihiko, to Sharp Kabushiki Kaisha. Computer system having automatic answering telephone function. 4,813,069, Cl. 379-82.000.
Tanaka, Teruo; Miyakusu, Katsuhisa; and Fujimoto, Hiroshi, to Nisshin Steel Co., Ltd. Process for the production of a strip of a chromium stainless steel of a duplex structure having high strength and elongation as well as reduced plane antisotropy. 4,812,176, Cl. 148-12.0EA.
Tanaka, Toshiyuki: *See*—
Ogata, Nobuo; Nakata, Yasuo; Satou, Hideaki; Tanaka, Toshiyuki; Minami, Etsuji; Yoshida, Yoshio; Kurata, Yukio; and Inoue, Teruaki, deceased, 4,812,638, Cl. 250-201.000.
Tanaka, Tsutomu: *See*—
Ushiro, Seimei; Ohmura, Hiroshi; Cho, Michio; Tanaka, Tsutomu; Tanaka, Yasuhiko; Asano, Seiji; and Ohno, Kazunori, 4,812,866, Cl. 354-288.000.
Tanaka, Yasuhiko: *See*—
Ushiro, Seimei; Ohmura, Hiroshi; Cho, Michio; Tanaka, Tsutomu; Tanaka, Yasuhiko; Asano, Seiji; and Ohno, Kazunori, 4,812,866, Cl. 354-288.000.
Tanaka, Yasuo: *See*—
Okada, Sumie; Nara, Takashi; Hatano, Takashi; Kawato, Yutaka; Shimozono, Ryoji; Tsutsumi, Kenji; Ogawa, Yasunori; and Tanaka, Yasuo, 4,812,839, Cl. 340-825.140.
Taneya, Mototaka; Matsumoto, Mitsuhiro; Kawanishi, Hidenori; and Matsui, Sadayoshi, to 501 Sharp Kabushiki Kaisha. Semiconductor laser array device. 4,813,051, Cl. 372-150.000.
Taniguchi, Motoaki: *See*—
Endo, Kazuyuki; Taniguchi, Motoaki; Yamada, Shigeki; Takahashi, Masanobu; and Kato, Kenshiro, 4,811,773, Cl. 152-543.000.
Taniguchi, Nobuyuki; Hata, Yoshiaki; Kudo, Yoshinobu; Inoue, Manabu; Hoda, Takeo; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Photographic camera. 4,812,871, Cl. 354-421.000.
Tanimoto, Yoshihiro, to Sanyo Electric Co., Ltd. Electrophotographic copying machine having an editorial function. 4,812,875, Cl. 355-7.000.
Taniyasu, Kiyoshi: *See*—
Kagawa, Keiichi; and Taniyasu, Kiyoshi, 4,812,374, Cl. 429-50.000.
Tank, Eggert: *See*—
Buhl, Horst; Kleinekathofer, Wolfgang; and Tank, Eggert, 4,811,701, Cl. 123-188.0AA.
Tanoshima, Katsuhide; Suzuki, Yasuhiro; Nagata, Shizuo; and Shimizu, Yasuo, to Oki Electric Industry Co., Ltd. External magnetic field generating device. 4,813,007, Cl. 346-74.500.
Tarabishi, M. Hisham. Diet pills. 4,812,315, Cl. 424-466.000.
Tarnowski, Thomas L.; Lin, Cheng-I; and Ullman, Edwin F., to Syntex (U.S.A.) Inc. Reversible agglutination medistors for separating cells from whole blood. 4,812,401, Cl. 435-29.000.
Tartusskiy gosudarstvenny Universitet: *See*—
Mikelsaar, Raik-Khtio N., 4,812,128, Cl. 434-278.000.
Tarutani, Yoshio: *See*—
Maehara, Yasuhiro; and Tarutani, Yoshio, 4,812,177, Cl. 148-12.0EA.
Tashiro, Mamoru; Urata, Kazuo; and Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Photo CVD apparatus, with deposition prevention in light source chamber. 4,811,684, Cl. 118-50.100.
Tashiro, Syuzaburou; Ina, Toshikazu; Nakano, Osamu; Taguchi, Masahiro; Onimaru, Sadahisa; and Kuno, Akira, to Nippondenso Co., Ltd.; and Nippon Soken, Inc. Vehicle seat drive control device. 4,812,838, Cl. 340-825.060.
Tatomir, Paul J.; and Hammond, Martin B., to Hughes Aircraft Company. Toothed coupling iris. 4,812,790, Cl. 333-212.000.
Tatsukami, Yoshiharu; Doi, Toshiki; and Oka, Masahiko, to Sumitomo Chemical Co.; and Daikin Industries Ltd. Optical fiber comprising a methacrylate polymer core and a fluoro polymer cladding. 4,812,011, Cl. 350-96.340.
Tauber, Michael. Hammer hat. 4,811,634, Cl. 81-21.000.
Tawfik, Adel S.: *See*—
Urquhart, Richard G.; and Tawfik, Adel S., 4,812,080, Cl. 405-227.000.
Taylor, Attalee S.: *See*—
Fleak, David S.; Rose, William H.; and Taylor, Attalee S., 4,812,133, Cl. 439-248.000.
Taylor, Charles S.: *See*—
Phillips, Alan C.; O'Brien, Terence J.; and Taylor, Charles S., 4,811,613, Cl. 74-5.60D.
Taylor, John W.: *See*—
Feltz, John F.; Taylor, John W.; and Vuketich, Richard S., 4,812,822, Cl. 340-572.000.
Taylor, Michael P., to Pitney Bowes Inc. Remote postage meter inspection system. 4,812,965, Cl. 364-550.000.
Taylor, Michael P.; and Chronsny, Wojciech M., to Pitney Bowes Inc. Postage meter locking system. 4,812,994, Cl. 364-464.020.
Taylor, Walter S. Transparent wine bottle closure and cork. 4,812,317, Cl. 426-87.000.
Tayon, Keith: *See*—
Lyons, Jerry L.; and Tayon, Keith, 4,811,752, Cl. 137-77.000.
TDK Corporation: *See*—
Satoh, Takateru; and Shiba, Haruo, 4,812,936, Cl. 360-132.000.
Teac Corporation: *See*—
Mashimo, Akira, 4,813,034, Cl. 369-116.000.
Team Construction and Fabrication, Inc.: *See*—
Falgout, Thomas E., Sr.; and Schoeffler, William N., 4,811,798, Cl. 175-73.000.
Technical Research Assoc., Inc.: *See*—
Alexander, Guy B., 4,812,289, Cl. 420-528.000.
Technicon Instruments Corporation: *See*—
Uffenheimer, Kenneth F., 4,811,611, Cl. 73-864.220.
Teijin, Limited: *See*—
Hiramatsu, Toshiyuki; Azuma, Shizuo; Nakagawa, Koji; and Ichikawa, Yataro, 4,812,163, Cl. 71-92.000.
Teikoku Kako Co., Ltd.: *See*—
Kimura, Shiuji, 4,812,174, Cl. 148-251.000.
Tektronix, Inc.: *See*—
Agoston, Agoston, 4,812,769, Cl. 328-63.000.
Correll, Ronald E., 4,812,707, Cl. 313-435.000.
Culpepper, Charles F., 4,813,045, Cl. 372-38.000.
Stubbs, David D., 4,812,996, Cl. 364-487.000.
Tallman, James L., 4,813,009, Cl. 364-900.000.
Teleflex Incorporated: *See*—
Spease, Arthur L., 4,811,621, Cl. 74-501.50R.
Telenorma Telefonbau und Normalzeit GmbH: *See*—
Moses, Klaus; and Lange, Heinz, 4,813,072, Cl. 379-388.000.
Terada, Hiromu; Sakunaga, Kenichi; and Fukahori, Naoyuki, to Mitsubishi Rayon Company Ltd. Optical fiber array having fiber islands in a polymer sea. 4,812,012, Cl. 350-96.240.
Terada, Takashi; Aoki, Minoru; Ohtaki, Hiroshi; Morozumi, Manami; and Shiozaki, Mitsuharu, to Yamasa Shoyu Kabushiki Kaisha; and Nippon Kayaku Kabushiki Kaisha. Process for producing 1-β-D-arabinofuranosylcytosine-5'-stearylphosphate monosodium salt and monohydrate thereof. 4,812,560, Cl. 536-29.000.
Terada, Yasushi: *See*—
Kobayashi, Kazuo; Terada, Yasushi; and Nakayama, Takeshi, 4,813,018, Cl. 365-185.000.
Teradyne, Inc.: *See*—
Kern, Walter P., 4,812,745, Cl. 324-158.00P.
Term-Tronics, Incorporated: *See*—
O'Neil, James P.; and Powell, Ken R., 4,812,629, Cl. 235-383.000.
Terry, John: *See*—
Allen, David J.; Martin, Joseph; Rose, Peter E.; and Terry, John, 4,811,778, Cl. 164-516.000.
Tersalvi, Antonio: *See*—
Ferraris, Giampiero; and Tersalvi, Antonio, 4,812,388, Cl. 430-314.000.
Tethuo, Oonishi: *See*—
Toshiyuki, Nakaie; and Tethuo, Oonishi, 4,812,755, Cl. 324-158.00F.
Texaco Inc.: *See*—
Liu, Christopher S.; Benfaremo, Nicholas; Kapuscinski, Maria M.; and Grina, Larry D., 4,812,261, Cl. 252-51.50A.
Texas Instruments Incorporated: *See*—
Cobb, Carleton M., III; Hirsbrunner, Hans G.; Gonsalves, Edward M.; Jenne, Richard L.; and Nott, Sepideh H., 4,812,799, Cl. 337-70.000.
Kennon, James A.; Islam, Shafidul; Popken, Jeffrey L.; Medders, Jerry B.; Fitzgerald, Susan S.; Kelley, Donald R.; and Burr, Philip A., 4,812,114, Cl. 425-116.000.
Riemenschneider, Bert R., 4,812,885, Cl. 357-23.500.
Zimmerman, Dale E., 4,812,780, Cl. 330-253.000.
Texscan Corporation: *See*—
Wagner, R. Steven, 4,812,779, Cl. 330-149.000.
Thales Resources, Inc.: *See*—
Dallas, Stanley A., Jr., 4,812,746, Cl. 324-121.00R.
Theiss, David H., to Cameron Iron Works USA, Inc. Running tool. 4,811,784, Cl. 166-208.000.
Thermo King Corporation: *See*—
Mayer, Donald K., 4,811,571, Cl. 62-474.000.
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Aurouet, Claude; Blumenfeld, Henry; Bourdinaud, Michel; Calvet, Jean; Cavan, Jean-Claude; Meyer, Joao; and Thevenin, Jean-Claude, 4,812,013, Cl. 350-96.290.

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Thomann, Helmut: *See*—
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Thomas, Cyril J. A. Variable displacement rotary fluid machine. 4,812,111, Cl. 418-20.000.
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Feygenson, Anatoly, 4,812,890, Cl. 357-34.000.
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Jennings, William B.; Thompson, John; and Hayes, Richmond S., Jr., 4,811,570, Cl. 62-263.000.
Thompson, Mortimer S., to Tri-Tech Systems International Inc. Closure system and method of forming and using same. 4,811,857, Cl. 215-329.000.
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Thompson, Todd B.: *See*—
Lagieski, Daniel P.; and Thompson, Todd B., 4,811,445, Cl. 15-104.940.
Thomson Composants Militaires Et Spaciaux: *See*—
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Broussoux, Dominique; Micheron, Francois; Staron, Alain; and Trotel, Jacques, 4,812,647, Cl. 250-227.000.
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Funck, Ronald; and Henry, Raymond, 4,812,895, Cl. 357-69.000.
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Thurner, Elmar; and Buhri, Reinhard, to Hilti Aktiengesellschaft. Fastening element setting device with setting indicator. 4,811,883, Cl. 227-10.000.
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Meins, Jurgen; and Grosser, Helmut, 4,812,757, Cl. 324-207.000.
Tibbals, E. C., Jr. Circular weft knitting machine. 4,811,572, Cl. 66-13.000.
Tieman, Hans, to Arabian American Oil Company. Method and apparatus for enhancing seismic data. 4,813,027, Cl. 367-52.000.
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Tinti, Maria O.; Bagolini, Carlo A.; Misiti, Domenico; and Scolastico, Carlo, to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. Derivatives of L-amino acyl L-carnitine, process for their preparation and pharmaceutical compositions having hepatoprotecting activity containing same. 4,812,478, Cl. 514-550.000.
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Tobey, Richard. Computer element performance enhancer. 4,812,733, Cl. 323-285.000.
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Toda, Minoru, to General Electric Company. High frequency signal driver for a laser diode and method of forming same. 4,813,047, Cl. 372-38.000.
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Suzuki, Hiroshi, 4,812,104, Cl. 414-735.000.
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Tolan, Peter J. Method and apparatus for measuring the change in volume with change in temperature of liquid in tanks. 4,811,601, Cl. 73-29.00B.
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Toman, Perry A., to Glidden Company, The. High solids coatings with reactive diluent. 4,812,523, Cl. 525-162.000.
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Topcik, Barry, to Union Carbide Corporation. Tree resistant compositions. 4,812,505, Cl. 524-377.000.
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Toray Industries, Inc.: *See*—
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Torus Equipment, Inc.: *See*—
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Toshiyuki, Nakaie; and Tethuo, Oonishi, to Hanwa Electronic Co., Ltd. Base board for testing integrated circuits. 4,812,755, Cl. 324-158.00F.
Townsend Engineering Company: *See*—
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Townsend, Ray T., to Townsend Engineering Company. Blade for meat skinning machines. 4,811,459, Cl. 17-21.000.
Toya, Ichizo; and Yasuda, Tomokazu, to Fuji Photo Film Co., Ltd. Silver halide photographic material containing polymer fixation accelerator. 4,812,391, Cl. 430-564.000.
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Tra, Josef, to J. M. Voith GmbH. Screen cage. 4,812,229, Cl. 209-397.000.

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Tracy, Theodore A.; and Freuler, George H. Circuit board interfacing apparatus. 4,812,754, Cl. 324-158.00F.
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Dudasik, Edward M., 4,812,709, Cl. 313-478.000.
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Treace Medical, Inc.: *See*—
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Tremblay, Roger. Powder dispenser. 4,811,869, Cl. 222-440.000.
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Treybig, Duane S., to Dow Chemical Company, The. Thermosettable polymers or prepolymers prepared from heterocyclic materials having alkyl substituents, mono- or dianhydrides, ethylenically unsaturated materials and a hydroxide, carbonate or bicarbonate of a metal of groups I-A or II-A. 4,812,531, Cl. 525-419.000.
Tri-Tech Systems International Inc.: *See*—
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Leibowitz, Joseph D., 4,812,792, Cl. 333-238.000.
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Tsao, Fu-Pao; and Sills, M. Alicja, to Ciba-Geigy Corporation. Stabilized hydrogen peroxide contact lens disinfecting solution. 4,812,173, Cl. 134-27.000.
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Antipov, Georgy A.; Gelfand, Mikhail L.; Goldshtein, Boris G.; Korniliev, Gennady A.; Lavnikov, Nikolai S.; Tsipenjuk, Yakov I.; and Yakubovsky, Petr S., 4,811,797, Cl. 173-93.600.
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Tsukamoto, Koji, to Yamazaki Corporation. Mop holder. 4,811,446, Cl. 15-147.00R.
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Tsukazaki, Hisashi; Yamanishi, Kenichiro; and Yasunaga, Seiji, to Mitsubishi Denki Kabushiki Kaisha. Evaporation source with a shaped nozzle. 4,812,326, Cl. 427-38.000.
Tsumaki, Koji; Miyata, Kenji; and Nishi, Masatsugu, to Hitachi, Ltd. Electron beam stabilizing method for electron storing ring, and electron storing ring system. 4,812,774, Cl. 328-233.000.
Tsutsumi, Kenji: *See*—
Okada, Sumie; Nara, Takashi; Hatano, Takashi; Kawato, Yutaka; Shimozono, Ryoji; Tsutsumi, Kenji; Ogawa, Yasunori; and Tanaka, Yasuo, 4,812,839, Cl. 340-825.140.
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Tsuyuki, Shinzi, to Tokyo Electric Co., Ltd. Technique for improving the wear resistance of a wire matrix printing head. 4,812,061, Cl. 400-124.000.
Tujikawa, Masanori: *See*—
Hamashima, Yoshio; Minami, Kyoji; Kawata, Kyozo; Sakamoto, Teruo; Takeda, Toyohiko; Suzuki, Yusuke; and Tujikawa, Masanori, 4,812,561, Cl. 540-222.000.
Turner, Arthur, to Adana Limited. Thermographic printing machine for a roller-supported continuous web. 4,811,688, Cl. 118-674.000.
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Twin-Cee Limited: *See*—
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Ube Industries, Ltd.: *See*—
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Uchtman, Vernon A., to Procter & Gamble Company, The. Kit for use in the treatment of osteoporosis. 4,812,311, Cl. 424-112.000.
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Ueda, Hiroshi; and Sugimoto, Mamoru, to Sumitomo Electric Industries, Ltd. Method and device for measuring clearances between gears. 4,811,490, Cl. 33-179.50R.
Ueda, Hiroshi: *See*—
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Uerdingen, Walter: *See*—
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Ueta, Makoto: *See*—
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Uetani, Yasunori: *See*—
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Ueyama, Masayuki, to Minolta Camera Kabushiki Kaisha. Camera system with interchangeable lens unit. 4,812,865, Cl. 354-286.000.
Uffenheimer, Kenneth F., to Technicon Instruments Corporation. Apparatus and method for pressure equalization in closed tube sampler. 4,811,611, Cl. 73-864.220.
Ullman, Edwin F.: *See*—
Tarnowski, Thomas L.; Lin, Cheng-I; and Ullman, Edwin F., 4,812,401, Cl. 435-29.000.
Ulrich, Jorn; Weinhold, Friedrich; and Meyer, Meinhard, to B.A.T. Cigarettenfabriken GmbH. Apparatus for measuring the draw resistance of a rod of tobacco fibers. 4,811,744, Cl. 131-84.100.
Ulrich, Larry F. Electronic control means and improved method for controlling lights. 4,812,808, Cl. 340-468.000.
Ulseth, John W.: *See*—
Vogelgesang, Peter J.; Ulseth, John W.; Giorgini, Norman L.; and Edwards, Jathan D., 4,812,633, Cl. 235-487.000.
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Umemura, Shinichiro: *See*—
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Staal, Leendert H.; Vis, Jan C.; and Groeneweg, Jan W., 4,812,436, Cl. 502-407.000.
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Koleske, Joseph V.; and Kwiatkowski, George T., 4,812,488, Cl. 522-31.000.
Rifi, Mahmoud R., 4,812,526, Cl. 525-240.000.
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Zoeckler, Mary T.; and Karol, Frederick J., 4,812,432, Cl. 502-112.000.
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United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
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Nix, Lawrence A., Jr., 4,812,718, Cl. 315-382.000.
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Mendel, Clifford W., 4,812,715, Cl. 315-340.000.
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Albach, Manfred; Schafer, Ralf; Stormberg, Hans-Peter; and Wegener, Armin, 4,812,736, Cl. 323-224.000.
Bakker, Eppe; and Tietjens, Eduard W., 4,811,483, Cl. 30-43.600.
Bertram, Leo; Schemmann, Hugo; and Diefenbach, Gerhard, 4,812,691, Cl. 310-41.000.
Bierhoff, Martinus P. M., 4,813,031, Cl. 369-45.000.
Boudewijns, Arnoldus J. J., 4,812,887, Cl. 357-24.000.
Den Boef, Johannes H., 4,812,762, Cl. 324-309.000.
Duthuit, Olivier; Bonnet, Thierry; and Martin, Philippe, 4,812,988, Cl. 364-522.000.
Frequin, Vincentius T. M., 4,812,908, Cl. 358-174.000.
Fuderer, Miha; and Cuppen, Johannes J. M., 4,812,753, Cl. 324-307.000.
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Marcus, Stephen M., 4,813,074, Cl. 381-36.000.
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Panker, Vlad, 4,812,785, Cl. 331-117.0FE.
Prigent, Georges; Besnard, Patrick; and Dupaillon, Jacques, 4,812,946, Cl. 361-150.000.
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Wijma, Willem S.; Tietjens, Eduard W.; Bakker, Eppe; and Hoekstra, Albert, 4,811,484, Cl. 30-43.600.
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Iida, Takeaki; and Kawabe, Takeshi, 4,812,220, Cl. 204-403.000.
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Universal Instruments Corporation: *See*—
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Duggan, John A.; and Gombas, Robert P., 4,811,520, Cl. 49-409.000.
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Lopez-Berestein, Gabriel; Mehta, Reeta; Hopfer, Roy L.; and Juliano, Rudolph L., 4,812,312, Cl. 424-417.000.
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Urquhart, Richard G.; and Tawfik, Adel S., to Atlantic Richfield Company; and Brown & Root, Inc. Offshore platform jacket and method of installation. 4,812,080, Cl. 405-227.000.
Urschitz, Ernst, to Voest-Alpine Aktiengesellschaft. Movable consolidating trestle for securing the excavating edge. 4,812,081, Cl. 405-296.000.
Usami, Ikuzo; Sato, Yoshinori; Kurosawa, Yoshitaka; and Morimura, Kazuyuki, to Three Bond Co., Ltd. Method for containing two-part composition. 4,811,549, Cl. 53-428.000.
Usami, Ikuzo; Sato, Yoshinori; Kurosawa, Yoshitaka; and Morimura, Kazuyuki, to Three Bond Co., Ltd. Plate-like container for containing jellied two parts components. 4,811,838, Cl. 206-219.000.
USEC, Inc.: *See*—
Bolden, Ronald J., 4,811,968, Cl. 280-652.000.
Ushiro, Seimei; Ohmura, Hiroshi; Cho, Michio; Tanaka, Tsutomu; Tanaka, Yasuhiko; Asano, Seiji; and Ohno, Kazunori, to Fuji Photo Film Co., Ltd. Photographic film package. 4,812,866, Cl. 354-288.000.
Utagawa, Ken; and Hamanishi, Yoshinari, to Nikon Corporation. Detecting apparatus for focus in camera. 4,812,868, Cl. 354-402.000.
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Utsumi, Shigeo, to Diafoil Company, Limited. Thermal transfer (printing) material. 4,812,360, Cl. 428-337.000.
Utsunomiya, Taizo: *See*—
Koba, Keiichiro; Utsunomiya, Taizo; Saitow, Yoshiaki; Iwanaga, Katsusuke; Matsue, Michihiko; and Nishitani, Noriaki, 4,812,271, Cl. 264-63.000.
v.d. Nieuwelaar, Josephus A.; and Janssen, Petrus C. M., to Stork PMT B.V. Plucking device. 4,811,458, Cl. 17-11.10R.
Vaananen, Raimo, to Partek Corporation. Method and a device for the generation of hot air. 4,811,723, Cl. 126-113.000.
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Vahlne, Anders; Svennerholm, Bo; Rymo, Lars; Jeansson, Stig; and Horal, Peter, to Virovahl. Synthetic peptide antigen for the detection of HIV-2 infection. 4,812,556, Cl. 530-324.000.
Valeri, Marco; and Rocchini, Carlo A., to Alcatel N. V. Terminal access protocol circuit for optical fiber star network. 4,813,012, Cl. 364-900.000.
Vallerand, Ivan. Method and device for plugging a hole. 4,811,531, Cl. 52-127.500.
VanDahm, Richard A.: *See*—
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van de Grift, Robert E. J.; and van der Veen, Martien, to U.S. Philips Corporation. Electronic circuit with complementary data line. 4,812,816, Cl. 341-133.000.
Vanderpoel, Richard E.: *See*—
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Van der Ven, Robert F. L. M., to U.S. Philips Corp. Color television display tube. 4,812,704, Cl. 313-402.000.
Vandervoort, David; and Griffith, Monty, to Bridgford Foods Corporation. Method of subdividing dough. 4,812,321, Cl. 426-503.000.
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Van Kirk, Larry J.; and Waterloo, Ronald L., to Ford Motor Company. Multiple conductor fluid handling duct for an automotive vehicle. 4,811,760, Cl. 138-115.000.
VanRiper, Bradley C.: *See*—
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Van Sloun, Peter H., to Honeywell Inc. Safety clip with controlled release force. 4,811,470, Cl. 24-453.000.
Vanstaen, Roland, to Barco Automation N.V. Method for measuring a physical quantity providing digital data using analog-value measuring devices, and measuring apparatus for applying this method. 4,812,043, Cl. 356-385.000.
van Ulden, Petrus J. L. C. Method for manufacturing a tape of photographic slides. 4,812,347, Cl. 428-77.000.
Varghese, Philip: *See*—
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Eckstein, James N.; Webb, Christopher; and Weng, Shang-Lin, 4,812,650, Cl. 250-307.000.
Variety Accessories, Inc.: *See*—
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Varrasso, Eugene C.: *See*—
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Vartiainen, Seppo: *See*—
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Verbrugge, Pieter A.; and de Waal, Jannetje, to Shell Oil Company. Catalytic hydrogenolysis. 4,812,581, Cl. 548-953.000.
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Verkuil, Roger L.: *See*—
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Vernay Laboratories, Inc.: *See*—
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Vickers, Incorporated: *See*—
Edwards, Thomas L.; El-Ibiary, Yehia M.; Gunda, Rajamouli; Leemhuis, Richard S.; Phillips, Fred H.; and Rode, Melvin A., 4,811,561, Cl. 60-368.000.
Lonnemo, Kurt R., 4,811,650, Cl. 91-461.000.
Vickers Systems Limited: *See*—
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Vijuk Bindery Equipment, Inc.: *See*—
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Virey, Franck; and Goumy, Daniel, to L'Air Liquide. Process for manufacturing glass objects. 4,812,156, Cl. 65-83.000.
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Vocal, Rodolfo S. Well medicine strip. 4,812,305, Cl. 424-448.000.
Voest-Alpine Aktiengesellschaft: *See*—
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Vogelgesang, Peter J.; Ulseth, John W.; Giorgini, Norman L.; and Edwards, Jathan D., to Minnesota Mining and Manufacturing Company. Optical data card. 4,812,633, Cl. 235-487.000.
Vogl, Otto; and Nir, Zohar, to United States of America, Energy. Process for the preparation of benozotriazoles and their polymers, and 2(2-hydroxy-5-isopropenylphenyl)2H-benzotriazole produced thereby. 4,812,575, Cl. 548-260.000.
Volkswagen AG: *See*—
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Honig, Ernst-August; Kaspar, Lothar; Kalversberg, Manfred; Oberpichler, Gerd; Hagemann, Gottfried; and Schmidt, Dieter, 4,811,631, Cl. 74-762.000.
Volpe, James R.; and Kelley, James L. Unitary disposable chair, formable from fiberboard in one pass with minimal waste, and quickly set up. 4,811,987, Cl. 297-440.000.
VonDeylen, Vernon F.: *See*—
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Von Kopp, Guenter, to Auergesellschaft GmbH. Respirator hood. 4,811,728, Cl. 128-201.250.
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Wada, Hideo; Abe, Shuichi; and Watanabe, Tsuyoshi, to Hitachi, Ltd. Data processing apparatus for processing list vector instructions. 4,812,974, Cl. 364-200.000.
Wada, Yoshihiro; and Fujii, Ryoichi, to Sharp Kabushiki Kaisha. Display segment configuration suitable for Celsius and Fahrenheit thermometer. 4,812,835, Cl. 340-756.000.
Waechter, Manfred: *See*—
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Wagenknecht, Arthur J.; Anderson, John R.; and Guzikowski, Joseph A., to GTE Products Corporation. Article supporting stud and CRT face panel employing same. 4,812,705, Cl. 313-406.000.
Wagensonner, Eduard; Ruf, Wolfgang; Fuchsberger, Hermann; and Birgmeir, Klaus, to AGFA-Gevaert Aktiengesellschaft. Method of electronically improving the sharpness and contrast of a colored image for copying. 4,812,903, Cl. 358-80.000.
Wagner, Harald; and Schulter, Alfred, to Ingenieure Mayreder, Kraus & Co. Baugeseilschaft M.b.H. Tubbing ring for lining a tunnel. 4,812,084, Cl. 405-153.000.
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Walker, Joseph K., Jr., to ELTECH Systems Corporation. Purifying refractory metal borides. 4,812,425, Cl. 501-96.000.
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Warren, Harold C., III; and Snyder, Brian A., to Eastman Kodak Company. Immunoreactive reagent particles having tracer, receptor molecules and protein of pI less than 6. 4,812,414, Cl. 436-533.000.

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Wason, Satish K., to J. M. Huber Corporation. Synthetic alkali metal alumino-silicates, methods and uses, compositions and their methods of preparation. 4,812,299, Cl. 423-328.000.

Wass, Anthony; and Law, Brian, to English Glass Company Limited, The. Liquid dosing device. 4,811,871, Cl. 222-477.000.

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Watanabe, Yoshiaki; Yokoo, Chihiro; Goi, Masami; Onodera, Akira; Murata, Mitsuo; Fukushima, Hiroshi; and Sota, Kaoru, to Taisho Pharmaceutical Co., Ltd. Cephalosporin derivatives. 4,812,562, Cl. 540-227.000.

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Watts, Lawrence E., to Quaker Chemical Corporation. Process for treating waste water contaminated with manganese. 4,812,240, Cl. 210-639.000.

Watts, Verne C.; Lorass, Orlan J.; Kaczmarski, Wally L.; and Asche, James E., to Clark Equipment Company. Gas spring with latching stop mechanism for use on skid-steer loaders. 4,811,983, Cl. 296-190.000.

Waymouth, John F.: *See*—
Keeffe, William M.; Waymouth, John F.; and Zaslavsky, Gregory, 4,812,714, Cl. 315-60.000.

Webb, Christopher: *See*—
Eckstein, James N.; Webb, Christopher; and Weng, Shang-Lin, 4,812,650, Cl. 250-307.000.

Webb, Joseph D.: *See*—
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Weber, Friedrich: *See*—
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Weber, Georg: *See*—
Krause, Joachim; Romer, Michael; Pohl, Ludwig; Scheuble, Bernhard; and Weber, Georg, 4,812,258, Cl. 252-299.610.

Weber, James L., to Halbrite Well Services Co. Ltd. No-turn tool. 4,811,785, Cl. 166-242.000.

Weber, Karl-Heinz: *See*—
Lehr, Erich; Bechtel, Wolf-Dietrich; Boke-Kuhn, Karin; Schneider, Claus; Walther, Gerhard; and Weber, Karl-Heinz, 4,812,453, Cl. 514-255.000.

Webster, Noel E.; and Meredith, Kimberly. Portable locking device. 4,811,577, Cl. 70-14.000.

Wegener, Armin: *See*—
Albach, Manfred; Schafer, Ralf; Stormberg, Hans-Peter; and Wegener, Armin, 4,812,736, Cl. 323-224.000.

Weinhold, Friedrich: *See*—
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Weirton Steel Corporation: *See*—
Saunders, William T.; and Livingston, Warren D., 4,812,365, Cl. 428-469.000.

Weisbart, Richard H., to University of California, The Regents of the. MAB-anti-DNA related to nephritis. 4,812,397, Cl. 435-7.000.

Weiss, Manfred. Apparatus for decreasing the alcohol content of alcohol-containing beverages, particularly wine and sparkling wine. 4,812,232, Cl. 210-181.000.

Welch, Dennis E.; and Waldschmidt, William L., to Thermo King Corporation. Zero cube transport refrigeration unit for straight trucks. 4,811,569, Cl. 62-239.000.

Welding Institute, The: *See*—
King, Clive G.; Padilla, John A.; and Sproulle, Richard J., 4,811,887, Cl. 228-2.000.

Wells, Charles H., to Cadtrak Corporation. Graphics display system with arbitrary overlapping viewports. 4,812,834, Cl. 340-721.000.

Welsh, David E.: *See*—
Wilson, Albert H.; and Welsh, David E., 4,812,137, Cl. 439-607.000.

Weng, Shang-Lin: *See*—
Eckstein, James N.; Webb, Christopher; and Weng, Shang-Lin, 4,812,650, Cl. 250-307.000.

Wenger, Jean; and Winternitz, Paul, to Hoffmann-La Roche Inc. Herbicidal heterocyclic compounds. 4,812,164, Cl. 71-92.000.

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Werner, Leonhard: *See*—
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Wesebaum, Paul E.: *See*—
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Wessel, Wolf: *See*—
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Stumpp, Gerhard; and Wessel, Wolf, 4,811,711, Cl. 123-359.000.

West, Michael W. J., to Du Pont de Nemours, E. I., and Company. Dispersants resistant to color change. 4,812,517, Cl. 525-94.000.

Western Industries Inc.: *See*—
Mueller, Raymond, Jr.; and Nelson, Richard, 4,811,865, Cl. 222-153.000.

Westfall, Norman R.: *See*—
Ost, Wilford G.; and Westfall, Norman R., 4,811,455, Cl. 16-197.000.

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Griffin, Rodney L.; Ciliberti, David F.; and Lippert, Thomas E., 4,812,149, Cl. 55-71.000.
Grimble, Ralph E.; and Somers, Edward V., 4,812,373, Cl. 429-19.000.
Heymann, Frank J., 4,812,105, Cl. 415-134.000.
Hwang, Edward Y., 4,811,565, Cl. 60-646.000.
Isenberg, Arnold O., 4,812,329, Cl. 427-115.000.
Linzer, Frederick D.; and Hauck, Paul L., 4,811,783, Cl. 165-134.100.
Miller, Robert C., 4,812,025, Cl. 350-435.000.
Morse, Alfred W., 4,812,686, Cl. 307-491.000.
Riedel, Ernest P.; and Boenning, Robert A., 4,812,037, Cl. 356-35.000.
Silvestri, George J., Jr.; and Hargrove, Homer G., 4,811,566, Cl. 60-646.000.
Stapleton, Cecil R., 4,812,285, Cl. 376-203.000.

Wetsel, John L. Window trim system. 4,811,533, Cl. 52-211.000.

Wexler, Joel S.; and Bednarz, John J., to Cyborg Systems, Inc. Time clock system. 4,812,627, Cl. 235-377.000.

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Whirlpool Corporation: *See*—
Query, Daniel S.; and Zummer, Linda A., 4,812,810, Cl. 340-545.000.
Whitaker, Charles N.; and Zimmermann, Richard E. Cyclic control stick. 4,811,921, Cl. 244-234.000.
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White, Kevin R.; and Gilmore, Danny R. Writing implement having built-in paper dispenser. 4,812,069, Cl. 401-195.000.
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Whitehead, Clay T., to National Exchange, Inc. Fully interconnected spot beam satellite communication system. 4,813,036, Cl. 370-57.000.
Whiteley, Steve, to Hypres, Inc. Incremental time delay generator. 4,812,689, Cl. 307-605.000.
Whiteman, Marvin E., Jr. Unidirectional to bidirectional angular displacement conversion apparatus. 4,811,617, Cl. 74-422.000.
Whittle, Alan J., to Imperial Chemical Industries PLC. Insecticidal alkenes. 4,812,483, Cl. 514-721.000.
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Wiesemann, Bruce O., to Wieseman Enterprises, Inc. Self cleaning rotating fine polishing filter screen apparatus. 4,812,231, Cl. 210-158.000.
Wijma, Willem S.; Tietjens, Eduard W.; Bakker, Eppe; and Hoekstra, Albert, to U.S. Philips Corp. Dry-shaving apparatus. 4,811,484, Cl. 30-43.600.
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Wiley, James G., Jr., to Comet Trailer Corp. Rear wheel suspension system for straddle carriers. 4,811,972, Cl. 280-683.000.
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Wilhelm, Raymond L., to Oy Wartsila Ab. Rinse water valve for vacuum toilet system. 4,811,754, Cl. 137-218.000.
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Shanklin, James R., Jr.; and Wilkinson, James M., II, 4,812,452, Cl. 514-212.000.
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Williams, Joseph P. Underarm security pouch for carrying cash receipts container. 4,811,768, Cl. 150-102.000.
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Wilson, Albert H.; and Welsh, David E., to ITT Corporation. Connector with EMI/RFI grounding spring. 4,812,137, Cl. 439-607.000.
Wilson Greatbatch Ltd.: *See*—
Rudolph, Frank W., 4,812,376, Cl. 429-101.000.
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Wilwerding, Dennis J., to Honeywell Inc. Slit lens autofocus system. 4,812,640, Cl. 250-204.000.
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Winston, Anthony; Marder, Herman; and Sorenson, Wayne, to Church & Dwight Co., Inc. Hydrogen peroxide-releasing tooth powder. 4,812,308, Cl. 424-52.000.
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Woods, Daniel E.; Gocht, Ronald E.; Higgins, Peter M.; Edwards, Anne M.; Rowlands, Hugh; Scanlon, Edward F.; and Putzer, Jerry, to Scan-Optics, Inc. Sales transaction record processing system and method. 4,813,077, Cl. 382-7.000.
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World Manufacturing, Inc.: *See*—
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Wright, Bradford B., to Minnesota Mining & Manufacturing Company. Method of combining siloxy groups with ketene-reactive compounds. 4,812,214, Cl. 204-157.740.
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Yagi, Mikio. Cleaning device for a container. 4,811,448, Cl. 15-211.000.
Yagisawa, Shigeru, to Toyoko Kagaku Co., Ltd. Nut holding thrust bearing and highly hermetical sealing fluid joint with the same nut. 4,811,976, Cl. 285-328.000.
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Yamagiwa, Akira; and Okabe, Toshihiro, to Hitachi, Ltd. Multiphase clock distribution for VLSI chip. 4,812,684, Cl. 307-480.000.
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Yamakawa, Tsutomu; and Iwao, Hirofumi, to Kabushiki Kaisha Toshiba. Processing of radioisotope-distribution imaging signals in a scintillation camera apparatus. 4,812,656, Cl. 250-363.00R.
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Yamamoto, Masahiro; Kumata, Mituyosi; Kozoe, Katutoshi; and Itoh, Tsutomu, to Onoda Cement Company, Ltd. Electrostatic powder coating apparatus. 4,811,689, Cl. 118-624.000.
Yamamoto, Taizo; Konishi, Hirokazu; Kawaguchi, Yoshihisa; and Ohnishi, Yoshizumi, to Nippon Elanco Kabushiki Kaisha. Method and apparatus for controlling a capsule filling machine. 4,811,802, Cl. 177-1.000.
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Yamori, Tsunefumi; Shuku, Shigekazu; and Fujioka, Hironari, to Kanzaki Paper Mfg. Co., Ltd. Heat-sensitive recording material. 4,812,438, Cl. 503-200.000.
Yanagi, Toru: *See*—
Osaka, Keiji; Yanagi, Toru; and Asano, Yasuo, 4,812,010, Cl. 350-96.220.
Yanagisawa, Masaaki, to Nikon Corporation. Gauss type near focus lens. 4,812,027, Cl. 350-463.000.
Yanagisawa, Shuich: *See*—
Murata, Yasushi; and Yanagisawa, Shuich, 4,812,857, Cl. 346-137.000.
Yang, Ji L.; and Melanson, Ronald J., to Digital Equipment Corporation. Current mode logic switching circuit having a Schmitt trigger. 4,812,676, Cl. 307-290.000.
Yang, Tai-Her. Electro magnetic braking circuit for small single phase induction motors. 4,812,728, Cl. 318-760.000.
Yannascoli, Donald: *See*—
Etemad, Shahrokh; Yannascoli, Donald; and Hatzikazakis, Michael, 4,811,471, Cl. 29-156.40R.
Yant, Robert M. Asphalt hopper heating system. 4,812,076, Cl. 404-108.000.
Yardney Corporation: *See*—
Berchielli, Aldo S., 4,811,481, Cl. 29-825.000.
Yasuda, Tomokazu: *See*—
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Yasukawa, Junichi: *See*—
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Yasunaga, Seiji: *See*—
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Tsukazaki, Hisashi; Yamanishi, Kenichiro; and Yasunaga, Seiji, 4,812,326, Cl. 427-38.000.
Yasushi, Mikura; Kensuke, Asada; and Hajime, Toguchi, to Takeda Chemical Industries. Stable composition of interleukin-2 and human serum albumin. 4,812,557, Cl. 530-351.000.
Yazaki Corporation: *See*—
Kondo, Hiroki; Saito, Hiroaki; Katsumata, Makoto; and Kinoshita, Michitaka, 4,812,138, Cl. 439-865.000.

Sato, Yoshitake; Ohike, Toshio; and Nakazaki, Youji, 4,812,749, Cl. 324-106.000.
Yoneyama, Norihiro, 4,811,922, Cl. 248-73.000.
Yazawa, Kazunaga: *See*—
Kawai, Yasuo; and Yazawa, Kazunaga, 4,812,441, Cl. 514-2.000.
Yechiel, Elishalom: *See*—
Barenholz, Yechezkel; and Yechiel, Elishalom, 4,812,314, Cl. 424-450.000.
Yeh, Shih-Yuan. Fishing reel with removable rotor. 4,811,916, Cl. 242-84.20R.
Yerly, Marcel; and Christl, Klaus, to Bobst SA. Method and device for measuring the cutting forces and limiting overloads of the cutting force in a platen press. 4,812,984, Cl. 364-474.000.
Yissum Research & Dev. Co. of the Hebrew Univ. of Jerusalem and Hadassah Medical Organization: *See*—
Barenholz, Yechezkel; and Yechiel, Elishalom, 4,812,314, Cl. 424-450.000.
Yokobayashi, Toshiaki; Yabe, Ryohei; and Matsushita, Hajime, to Hitachi, Ltd. Cell classification apparatus capable of displaying a scene obtained by superimposing a character scene and graphic scene on a CRT. 4,812,909, Cl. 358-183.000.
Yokogawa, Kazufumi: *See*—
Omura, Takashi; and Yokogawa, Kazufumi, 4,812,558, Cl. 534-618.000.
Yokohama Rubber Co., Ltd., The: *See*—
Watanabe, Hideo; and Ohashi, Yoshinobu, 4,812,489, Cl. 522-42.000.
Yokokura, Takashi; Gemma, Takashi; and Satoh, Takuji. Holographic interferometer. 4,812,042, Cl. 356-348.000.
Yokoo, Chihiro: *See*—
Watanabe, Yoshiaki; Yokoo, Chihiro; Goi, Masami; Onodera, Akira; Murata, Mitsuo; Fukushima, Hiroshi; and Sota, Kaoru, 4,812,562, Cl. 540-227.000.
Yokoo, Kazuhiro: *See*—
Imai, Shozaburo; Isobe, Michihisa; Yokoo, Kazuhiro; and Matsuura, Hideaki, 4,812,345, Cl. 428-65.000.
Yokota, Akihiro: *See*—
Iwamoto, Hiroshi; Tamura, Yutaka; Mizuno, Yuji; and Yokota, Akihiro, 4,812,916, Cl. 358-289.000.
Yokota, Fumiki: *See*—
Tamura, Kinichi; Kawada, Susumu; Sekine, Yoshitada; Abe, Kazuyoshi; Ishikawa, Ryosuke; and Yokota, Fumiki, 4,811,935, Cl. 269-34.000.
Yokoyama, Shigeki; Kamiya, Takeshi; Niikawa, Takeo; Nagase, Masakatsu; and Kuroishi, Tetujiro, to Nippon Petrochemicals Co., Ltd.; and Chukoh Chemical Industries, Ltd. Finish laminates for high frequency circuits. 4,812,355, Cl. 428-215.000.
Yoneda, Nobuhiko: *See*—
Obata, Kenji; Yoneda, Nobuhiko; Kataita, Masabumi; I, Yoshihiro; and Yamashita, Hironori, 4,812,203, Cl. 159-6.200.
Yoneyama, Norihiro, to Yazaki Corporation. Flat wire harness attaching unit. 4,811,922, Cl. 248-73.000.
Yonezawa, Keitaro, to Kabushiki Kaisha Kosmek. Apparatus for driving piston by fluid pressure. 4,812,109, Cl. 417-401.000.
Yorita, Masaru: *See*—
Inagaki, Hiromi; Matsuura, Kazuo; Koike, Tetsuya; Suenaga, Toshihiko; Yorita, Masaru; and Izawa, Masaki, 4,811,933, Cl. 267-140.100.
Yoshida, Akiyoshi: *See*—
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Yoshida, Atsushi: *See*—
Okamoto, Shingo; Kiryu, Masao; and Yoshida, Atsushi, 4,812,336, Cl. 427-257.000.
Yoshida, Kiminobu; Shiomi, Akio; and Watanabe, Kazuhisa, to Sumitomo Electric Industries, Ltd. Method for producing glass preform for optical fiber. 4,812,154, Cl. 65-3.110.
Yoshida Kogyo K. K.: *See*—
Yamada, Yasuo, 4,811,468, Cl. 24-442.000.
Yoshida, Nabuyuki: *See*—
Takao, Hiroyoshi; Yoshida, Nabuyuki; Imai, Akio; Tsuji, Mitsuji; and Saito, Yuichi, 4,812,527, Cl. 525-250.000.
Yoshida, Noriyuki, to Brother Kogyo Kabushiki Kaisha. Information display for a zigzag sewing machine. 4,811,673, Cl. 112-445.000.
Yoshida, Toshihiko: *See*—
Tanaka, Nobuo; Tominaga, Satoshi; Okada, Hisao; and Yoshida, Toshihiko, 4,813,069, Cl. 379-82.000.
Yoshida, Toshio: *See*—
Ohmura, Hiroshi; Asano, Seiji; and Yoshida, Toshio, 4,812,863, Cl. 354-219.000.
Yoshida, Yasuhiko; Honda, Masahiro; and Takizawa, Shozo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Rear-wheel steering apparatus. 4,811,805, Cl. 180-140.000.
Yoshida, Yoshio: *See*—
Ogata, Nobuo; Nakata, Yasuo; Satou, Hideaki; Tanaka, Toshiyuki; Minami, Etsuji; Yoshida, Yoshio; Kurata, Yukio; and Inoue, Teruaki, deceased, 4,812,638, Cl. 250-201.000.
Yoshigi, Mayumi: *See*—
Antoku, Fujio; Yoshigi, Mayumi; Saji, Ikutaro; Kojima, Atsuyuki; and Ishizumi, Kukuo, 4,812,461, Cl. 514-278.000.
Yoshihiro, Takiyasu, to Hitachi, Ltd. Loop transmission system and data transmission control method. 4,813,039, Cl. 370-89.000.
Yoshimoto, Kyosuke: *See*—
Benii, Toshihiko; and Yoshimoto, Kyosuke, 4,812,726, Cl. 318-640.000.
Yoshimura, Katsuji: *See*—
Nagashima, Yoshitake; Ishikawa, Hisashi; Kozuki, Susumu; Yoshimura, Katsuji; Takahashi, Koji; and Nagasawa, Kenichi, 4,812,920, Cl. 358-310.000.
Yoshimura, Masakatsu: *See*—
Nagasaki, Hideo; Yachigo, Shinichi; Ishii, Tamaki; Yoshimura, Masakatsu; Takahashi, Yukoh; and Yamamoto, Hiroki, 4,812,494, Cl. 524-91.000.
Yoshinaga, Kazuo; Katagiri, Kazuharu; and Shinjo, Kenji, to Canon Kabushiki Kaisha. Lactic acid derivative, liquid crystal composition containing same and liquid crystal device. 4,812,259, Cl. 252-299.650.
Yoshioka, Haruhiko: *See*—
Sakai, Hiroyuki; Yoshioka, Kazutoshi; Matsumura, Kimiharu; Shigaki, Keisuke; Amemiya, Yutaka; Iimuro, Shunichi; Yoshioka, Haruhiko; and Onoe, Teruhiko, 4,812,201, Cl. 156-643.000.
Yoshioka, Kazutoshi: *See*—
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Yoshioka, Naoki: *See*—
Kyoto, Michihisa; Yoshioka, Naoki; Tanaka, Gotaro; Kanamori, Hiroo; Watanabe, Minoru; and Nakahara, Motohiro, 4,812,155, Cl. 65-3.120.
Yoshioka, Takeo; Chida, Noritaka; Watanabe, Azuma; Fukagawa, Yasuo; and Ishikura, Tomoyuki, to Sanraku Incorporated. 6-(disubstituted amino)carbapenam compounds. 4,812,563, Cl. 540-302.000.
Yu, Chin-Ching: *See*—
Huang, Mijuel E. J.; Chao, Suyueh; Yu, Chin-Ching; and Hsu, Chi-Chu, 4,811,495, Cl. 34-131.000.
Yuasa, Masami; Abe, Kazumi; Shibamoto, Masaji; and Yakabe, Masahiro, to Seishi Gijutsu Kenkyu Kumiai. Headbox for paper machine with parallel twisted plates. 4,812,208, Cl. 162-343.000.
Yuhaku, Satoru; Nakatani, Seiichi; Nishimura, Tsutomu; and Ishida, Toru, to Matsushita Electric Industrial Co., Ltd. Dielectric paste and method of manufacturing the paste. 4,812,422, Cl. 501-20.000.
Yumoto, Manabu: *See*—
Kuramoto, Kenji; and Yumoto, Manabu, 4,812,787, Cl. 333-1.100.
Yumoto, Tetsuo, to Sankyo Kasei Kabushiki Kaisha. Process for the production of molded articles having partial metal plating. 4,812,275, Cl. 264-129.000.
Yumoto, Tetsuo, to Sankyo Kasei Kabushiki Kaisha. Process for the production of circuit board and the like. 4,812,353, Cl. 428-172.000.
Yuzawa, Masayuki: *See*—
Yamaoka, Naoji; Ozawa, Shogo; Fukai, Naoki; Yuzawa, Masayuki; Nakamura, Takeshi; and Asano, Yutaka, 4,811,891, Cl. 228-182.000.
Zabar, Nachum. Electromagnetic devices having selectively movable core winding. 4,812,795, Cl. 335-258.000.
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Lehmann, Hans; and Zahir, Abdul-Cader, 4,812,538, Cl. 525-505.000.
Zahn, Erwin: *See*—
Scherzer, Dietrich; Zahn, Erwin; and Frank, Wolfram, 4,812,368, Cl. 428-332.000.
Zahnradfabrik Friedrichshafen AG: *See*—
Christian, Klaus; and Gerd, Fuhrer, 4,811,825, Cl. 192-53.00F.
Lang, Armin, 4,811,806, Cl. 180-141.000.
Zambon S.p.A.: *See*—
Ferrrari, Vittorio; Carenzi, Angelo; and Della Bella, Davide, 4,812,477, Cl. 514-513.000.
Zanner, Johann: *See*—
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Zard, Lydia: *See*—
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Zaslavsky, Gregory: *See*—
Keeffe, William M.; Waymouth, John F.; and Zaslavsky, Gregory, 4,812,714, Cl. 315-60.000.
Zeigler, John M., to United States of America, Energy. Method for the preparation of novel polyacetylene-type polymers. 4,812,520, Cl. 525-101.000.
Zenith Electronics Corporation: *See*—
Hathaway, Roger C.; and Srivastava, Gopal K., 4,812,907, Cl. 358-153.000.
Zhang, Zhixin: *See*—
Fang, Hongsheng; Zhao, Rufa; Zheng, Yankang; Chen, Ziuyun; He, Guangchu; Gu, Jiaoyou; Zhu, Mingang; Zhang, Zhixin; and Tong, Keging, 4,812,182, Cl. 148-330.000.
Zhao, Rufa: *See*—
Fang, Hongsheng; Zhao, Rufa; Zheng, Yankang; Chen, Ziuyun; He, Guangchu; Gu, Jiaoyou; Zhu, Mingang; Zhang, Zhixin; and Tong, Keging, 4,812,182, Cl. 148-330.000.
Zheng, Yankang: *See*—
Fang, Hongsheng; Zhao, Rufa; Zheng, Yankang; Chen, Ziuyun; He, Guangchu; Gu, Jiaoyou; Zhu, Mingang; Zhang, Zhixin; and Tong, Keging, 4,812,182, Cl. 148-330.000.
Zhu, Mingang: *See*—
Fang, Hongsheng; Zhao, Rufa; Zheng, Yankang; Chen, Ziuyun; He, Guangchu; Gu, Jiaoyou; Zhu, Mingang; Zhang, Zhixin; and Tong, Keging, 4,812,182, Cl. 148-330.000.
Zieke, Larry M., to Dow Chemical Company, The. Reclosable, flexible container having an externally operated fastener. 4,812,056, Cl. 383-65.000.

Ziemek, Gerhard; Staschewski, Harry; and Gunia, Ewald, to Kabelmetal Electro GmbH. Method and apparatus for manufacturing small diameter, thick walled, cable sheaths. 4,811,888, Cl. 228-148.000.

Zimmerman, Dale E., to Texas Instruments Incorporated. Broadband differential amplifier. 4,812,780, Cl. 330-253.000.

Zimmermann, Richard E.: *See*—
Whitaker, Charles N.; and Zimmermann, Richard E., 4,811,921, Cl. 244-234.000.

Zimpro/Passavant Inc.: *See*—
Brandenburg, Bruce L.; Cooley, Curtis D.; and Ellis, Claude E., 4,812,243, Cl. 210-761.000.

Zinser Textilmaschinen GmbH: *See*—
Konig, Herbert; and Stahle, Gerhard, 4,812,993, Cl. 364-470.000.

Zmyslowski, Allan J.: *See*—
Maier, Robert M.; Zmyslowski, Allan J.; and Schober, Carolee N., 4,812,989, Cl. 364-200.000.

Zoeckler, Mary T.; and Karol, Frederick J., to Union Carbide Corporation. Ethylene polymerization catalyst. 4,812,432, Cl. 502-112.000.

Zubli, Albert F. Releasable pull cord engagement device. 4,811,466, Cl. 24-115.00G.

Zummer, Linda A.: *See*—
Query, Daniel S.; and Zummer, Linda A., 4,812,810, Cl. 340-545.000.

Zuricher Beteltuchfabrik AG: *See*—
Muller, Hans-Rudolf, 4,811,693, Cl. 119-15.000.

501 Max-Planck-Gesellschaft Zur Forderung der Wissenchaften E.V.: *See*—
Meier, Gerd; and Laake, Andreas, 4,811,815, Cl. 181-120.000.

501 Sharp Kabushiki Kaisha: *See*—
Taneya, Mototaka; Matsumoto, Mitsuhiro; Kawanishi, Hidenori; and Matsui, Sadayoshi, 4,813,051, Cl. 372-150.000.

589576 Ontario Inc.: *See*—
Slonimsky, Leonid; and Dorcich, Dan D., 4,811,927, Cl. 249-210.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF MARCH, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Hitachi, Ltd.: *See*—
Mori, Kinji; Nohmi, Makoto; Miyamoto, Shoji; Ihara, Hirokazu; Matsumaru, Hiroshi; and Ikeda, Katuaki, Re. 32,887, Cl. 340-825.050.

Honeywell, Inc.: *See*—
Stauffer, Norman L., Re. 32,886, Cl. 250-201.000.

Ihara, Hirokazu: *See*—
Mori, Kinji; Nohmi, Makoto; Miyamoto, Shoji; Ihara, Hirokazu; Matsumaru, Hiroshi; and Ikeda, Katuaki, Re. 32,887, Cl. 340-825.050.

Ikeda, Katuaki: *See*—
Mori, Kinji; Nohmi, Makoto; Miyamoto, Shoji; Ihara, Hirokazu; Matsumaru, Hiroshi; and Ikeda, Katuaki, Re. 32,887, Cl. 340-825.050.

Imperial Chemical Industries PLC: *See*—
Kirby, Ian J.; Mitchell, Michael I.; and Stratton, Andrew, Re. 32,888, Cl. 102-217.000.

Kirby, Ian J.; Mitchell, Michael I.; and Stratton, Andrew, to Imperial Chemical Industries PLC. Apparatus and method for selectively activating plural electrical loads at predetermined relative times. Re. 32,888, Cl. 102-217.000.

Litke, Alan E., to Loctite Corporation. Thixotropic cyanoacrylate compositions. Re. 32,889, Cl. 523-212.000.

Loctite Corporation: *See*—
Litke, Alan E., Re. 32,889, Cl. 523-212.000.

Matsumaru, Hiroshi: *See*—
Mori, Kinji; Nohmi, Makoto; Miyamoto, Shoji; Ihara, Hirokazu; Matsumaru, Hiroshi; and Ikeda, Katuaki, Re. 32,887, Cl. 340-825.050.

Mitchell, Michael I.: *See*—
Kirby, Ian J.; Mitchell, Michael I.; and Stratton, Andrew, Re. 32,888, Cl. 102-217.000.

Miyamoto, Shoji: *See*—
Mori, Kinji; Nohmi, Makoto; Miyamoto, Shoji; Ihara, Hirokazu; Matsumaru, Hiroshi; and Ikeda, Katuaki, Re. 32,887, Cl. 340-825.050.

Mori, Kinji; Nohmi, Makoto; Miyamoto, Shoji; Ihara, Hirokazu; Matsumaru, Hiroshi; and Ikeda, Katuaki, to Hitachi, Ltd. Message communication method and system. Re. 32,887, Cl. 340-825.050.

Nohmi, Makoto: *See*—
Mori, Kinji; Nohmi, Makoto; Miyamoto, Shoji; Ihara, Hirokazu; Matsumaru, Hiroshi; and Ikeda, Katuaki, Re. 32,887, Cl. 340-825.050.

Stauffer, Norman L., to Honeywell, Inc. Digital auto focus. Re. 32,886, Cl. 250-201.000.

Stratton, Andrew: *See*—
Kirby, Ian J.; Mitchell, Michael I.; and Stratton, Andrew, Re. 32,888, Cl. 102-217.000.

LIST OF DESIGN PATENTEES

ABL Arbetsbelysning AB: *See*—
Lungstrom, Kjell, 300,259, Cl. D26-28.000.

ABU Garcia Produktion Aktiebolag: *See*—
Johansson, Arne; and Carlsson, Lars-Olof, 300,236, Cl. D22-137.000.

Adams, Duane D., to North American Philips Corporation. Charger base for hand held battery operated vacuum cleaner. 300,214, 3-14-89, Cl. D13-6.000.

Advanced Technology Laboratories, Inc.: *See*—
LaCelle, Leroy J.; Ungar, Joseph L.; and Selke, Gary J., 300,241, Cl. D24-1.100.

Advertising Display Company: *See*—
Markson, Richard, 300,186, Cl. D6-300.000.

Aktiebolaget Electrolux: *See*—
Sjogren, Stig O.; and Johansson, Rolf A. G., 300,275, Cl. D29-14.000.

Alpha-Systems: *See*—
Vignot, Eric, 300,193, Cl. D6-542.000.

Anjuere, Catherine M. P.; Anjuere, Patrick M. J.; Grenot, Bernard; and Taffin de Givenchy, Philippe H. Housing module. 300,248, 3-14-89, Cl. D25-22.000.

Anjuere, Patrick M. J.: *See*—
Anjuere, Catherine M. P.; Anjuere, Patrick M. J.; Grenot, Bernard; and Taffin de Givenchy, Philippe H., 300,248, Cl. D25-22.000.

Aoki, Akio, to Figgie International Inc. Back wall for a baseball glove. 300,182, 3-14-89, Cl. D2-623.000.

Aoyama, Yoshihiko: *See*—
Yamase, Shinichi; Tsukui, Hiroaki; and Aoyama, Yoshihiko, 300,211, Cl. D12-110.000.

Arehart, Robert W., to Emerson Electric Co. Soldering iron. 300,200, 3-14-89, Cl. D8-30.000.

Armor All Products Corporation: *See*—
Vazquez, Thomas; and Ferguson, John D., 300,208, Cl. D9-378.000.

Aurora Impex Corporation: *See*—
Noguchi, Isoroku, 300,227, Cl. D18-2.000.

Avon Products, Inc.: *See*—
Brown, Jeffrey M.; Lepore, George S.; Scancarella, Neil D.; and Smith, Douglas B., 300,265, Cl. D28-7.000.

Basile, Joseph L. Silk screen rack bracket. 300,206, 3-14-89, Cl. D8-373.000.

Bausch & Lomb Incorporated: *See*—
Ramp, Robert H., 300,226, Cl. D16-102.000.

Bessec, Jean-Pierre; and Nodin, Michel, to Sporloisirs S.A. Shoe. 300,180, 3-14-89, Cl. D2-268.000.

Bore, Bjarne J. Animal feeder. 300,276, 3-14-89, Cl. D30-121.000.

Brenner, Stanley S.; and Chase, Charles, to Leviton Manufacturing Company, Inc. Lockable mount for an electric lamp socket. 300,215, 3-14-89, Cl. D13-25.000.

Brown, Jeffrey M.; Lepore, George S.; Scancarella, Neil D.; and Smith, Douglas B., to Avon Products, Inc. Design for cosmetic applicator. 300,265, 3-14-89, Cl. D28-7.000.

Brown Jordan Company: *See*—
Frinier, Richard, 300,189, Cl. D6-379.000.

Brown, Larry E.; and Lee, Wilton W. Fluid transfer needle. 300,246, 3-14-89, Cl. D24-53.000.

Byrne & Davidson Doors (N.S.W.) Pty. Limited: *See*—
Schremmer, Paul M., 300,220, Cl. D14-218.000.

Capitol Products Corporation: *See*—
Schmidt, Dietrich F., 300,255, Cl. D25-119.000.
Schmidt, Dietrich F., 300,256, Cl. D25-119.000.

Carlsson, Lars-Olof: *See*—
Johansson, Arne; and Carlsson, Lars-Olof, 300,236, Cl. D22-137.000.

Carnival Cruise Lines, Inc.: *See*—
Farcus, Joseph, 300,212, Cl. D12-317.000.

Cassai, Gino H.: *See*—
Cassai, Henry J.; and Cassai, Gino H., 300,269, Cl. D28-77.000.

Cassai, Henry J.; and Cassai, Gino H. Combined container/bottle and cosmetic wand applicators or the like. 300,269, 3-14-89, Cl. D28-77.000.

CertainTeed Corporation: *See*—
Stahl, Kermit E., 300,257, Cl. D25-139.000.

Charet, Pierre; and Kraai, Duke, to Rally Manufacturing, Inc. Combination automobile map light and electric lighter. 300,263, 3-14-89, Cl. D27-142.000.

Chase, Charles: *See*—
Brenner, Stanley S.; and Chase, Charles, 300,215, Cl. D13-25.000.

Clark, Fred C., to Lot-A-Wata, Inc. Automatic pet waterer and feeder. 300,277, 3-14-89, Cl. D30-122.000.

Comeau, Romeo J.: *See*—
Schold, Carl C.; and Comeau, Romeo J., 300,224, Cl. D15-124.000.

Commisso, Domenico: *See*—
Eckert, Ross J.; and Commisso, Domenico, 300,247, Cl. D25-2.000.

Coryea, Douglas L. Sawhorse. 300,251, 3-14-89, Cl. D25-67.000.

Coulson, Donna J. Dental scaler for removing plaque and tartar. 300,242, 3-14-89, Cl. D24-10.000.

DeCandia, Giovanni, to FL Industries, Inc. Photo electric control for outdoor floodlight or similar article. 300,262, 3-14-89, Cl. D26-138.000.

Desbiens, Yvonne A., to SAKS 2915 Illimite Inc. Bag. 300,207, 3-14-89, Cl. D9-305.000.

Don Watt & Associates Communications Inc.: *See*—
Shikatani, Edward R., 300,190, Cl. D6-459.000.

Eckert, Ross J.; and Commisso, Domenico, to Kayak Manufacturing Corp. Swimming pool liner. 300,247, 3-14-89, Cl. D25-2.000.

Eddins, Raymond T. Weighted book marker. 300,228, 3-14-89, Cl. D19-34.000.

Eguchi, Jutaro: *See*—
Odahara, Tetsuichi; Eguchi, Jutaro; and Murata, Kinichi, 300,221, Cl. D15-24.000.

Electrix, Inc.: *See*—
Shwisha, Haim, 300,261, Cl. D26-63.000.

Elliott, Glenaan M., to Glenaan, Inc. Handbag. 300,184, 3-14-89, Cl. D3-51.000.

Emerson Electric Co.: *See*—
Arehart, Robert W., 300,200, Cl. D8-30.000.
Schmitt, Thomas J., 300,252, Cl. D25-68.000.

Emhart Industries, Inc.: *See*—
Ipema, Neal J., 300,199, Cl. D8-10.000.

Eugster, Arthur. Coffee machine. 300,198, 3-14-89, Cl. D7-308.000.

Eyman, Waldorf C., Jr., to Gym Trix, Inc. Guide wire support for gymnastic equipment. 300,234, 3-14-89, Cl. D21-199.000.

Farcus, Joseph, to Carnival Cruise Lines, Inc. Ship's funnel. 300,212, 3-14-89, Cl. D12-317.000.

Ferguson, John D.: *See*—
Vazquez, Thomas; and Ferguson, John D., 300,208, Cl. D9-378.000.

Figgie International Inc.: *See*—
Aoki, Akio, 300,182, Cl. D2-623.000.

Finsilver, Charles E.; Taylor, Terry L.; and Roccaforte, Harry, to General Foods Corporation. Display box. 300,209, 3-14-89, Cl. D9-431.000.

Fioris Pty. Ltd.: *See*—
Rutherford, William, 300,222, Cl. D15-28.000.

FL Industries, Inc.: *See*—
DeCandia, Giovanni, 300,262, Cl. D26-138.000.

Forsberg, Paul J., to Keystone Retaining Wall Systems, Inc. Retaining wall block. 300,253, 3-14-89, Cl. D25-114.000.

Forsberg, Paul J., to Keystone Retaining Wall Systems, Inc. Retaining wall block. 300,254, 3-14-89, Cl. D25-114.000.

Frinier, Richard, to Brown Jordan Company. Chair. 300,189, 3-14-89, Cl. D6-379.000.

Fujii, Masao: *See*—
Sakuma, Kiyoshi; Tanimura, Yoshiaki; Umemura, Hiroyuki; Yamada, Makoto; Tsukamoto, Ikuo; Seshimo, Yu; and Fujii, Masao, 300,240, Cl. D23-314.000.

General Foods Corporation: *See*—
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Giorgetti S.P.A.: *See*—
Suman, Andriano, 300,187, Cl. D6-368.000.

Glenaan, Inc.: *See*—
Elliott, Glenaan M., 300,184, Cl. D3-51.000.

Godsey, James H.: *See*—
Navarro, Maria C.; Godsey, James H.; and Tepper, Richard G., 300,245, Cl. D24-31.000.

Graham, Karen L.: *See*—
Halsted, Milt J.; and Graham, Karen L., 300,202, Cl. D8-302.000.
Halsted, Milt J.; and Graham, Karen L., 300,203, Cl. D8-302.000.
Halsted, Milt J.; and Graham, Karen L., 300,204, Cl. D8-302.000.

Grenot, Bernard: *See*—
Anjuere, Catherine M. P.; Anjuere, Patrick M. J.; Grenot, Bernard; and Taffin de Givenchy, Philippe H., 300,248, Cl. D25-22.000.

Griffin, John, to Hoggan Health Industries, Inc. Weight lifting physical exerciser. 300,233, 3-14-89, Cl. D21-191.000.

Gym Trix, Inc.: *See*—
Eyman, Waldorf C., Jr., 300,234, Cl. D21-199.000.

Halsted, Milt J.; and Graham, Karen L., to Kwikset Corporation. Combined door handle and lock plate unit. 300,202, 3-14-89, Cl. D8-302.000.

Halsted, Milt J.; and Graham, Karen L., to Kwikset Corporation. Combined door handle and lock plate unit. 300,203, 3-14-89, Cl. D8-302.000.

Halsted, Milt J.; and Graham, Karen L., to Kwikset Corporation. Combined door handle and lock plate unit. 300,204, 3-14-89, Cl. D8-302.000.

Hans Rudolph, Inc.: *See*—
Rudolph, Hans; and Rudolph, Kevin A., 300,270, Cl. D29-7.000.
Rudolph, Hans; and Rudolph, Kevin A., 300,271, Cl. D29-7.000.
Rudolph, Hans; and Rudolph, Kevin A., 300,272, Cl. D29-7.000.
Rudolph, Hans; and Rudolph, Kevin A., 300,273, Cl. D29-7.000.
Rudolph, Hans; and Rudolph, Kevin A., 300,274, Cl. D29-7.000.

Hertzano, Micha. Playing piece. 300,231, 3-14-89, Cl. D21-51.000.

Hoggan Health Industries, Inc.: *See*—
Griffin, John, 300,233, Cl. D21-191.000.

Holterscheidt, Siegfried, to Walter Henkels GmbH. Manicure kit. 300,268, 3-14-89, Cl. D28-61.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Yamase, Shinichi; Tsukui, Hiroaki; and Aoyama, Yoshihiko, 300,211, Cl. D12-110.000.

Houlihan, John T., to Timex Corporation. Digital chronograph alarm timer wristwatch. 300,210, 3-14-89, Cl. D10-32.000.

Huang, Pin-Yan. Toy musical instrument. 300,232, 3-14-89, Cl. D21-64.000.

Iino, Masaaki, to Kabushiki Kaisha Toshiba. Telephone set. 300,216, 3-14-89, Cl. D14-151.000.

Iino, Masaaki, to Kabushiki Kaisha Toshiba. Telephone set. 300,217, 3-14-89, Cl. D14-150.000.

Ipema, Neal J., to Emhart Industries, Inc. Head for a shovel. 300,199, 3-14-89, Cl. D8-10.000.

Jimenez, Suzann, to L. A. Gear, Inc. For shoe upper. 300,181, 3-14-89, Cl. D2-314.000.

Johansson, Arne; and Carlsson, Lars-Olof, to ABU Garcia Produktion Aktiebolag. Detachable foot for fishing reels. 300,236, 3-14-89, Cl. D22-137.000.

Johansson, Rolf A. G.: *See*—
Sjogren, Stig O.; and Johansson, Rolf A. G., 300,275, Cl. D29-14.000.

Johoku Kogyo Kabushiki Kaisha: *See*—
Yamazaki, Takashi, 300,230, Cl. D19-69.000.

Kabushiki Kaisha Toshiba: *See*—
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Kayak Manufacturing Corp.: *See*—
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Keystone Retaining Wall Systems, Inc.: *See*—
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Forsberg, Paul J., 300,254, Cl. D25-114.000.

Kohler Co.: *See*—
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Kohler, Herbert V., Jr.; and Kolada, Paul P., to Kohler Co. Escutcheon for plumbing fitting. 300,238, 3-14-89, Cl. D23-249.000.

Kolada, Paul P.: *See*—
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Kraai, Duke: *See*—
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Kubota, Ltd.: *See*—
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Kwikset Corporation: *See*—
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Halsted, Milt J.; and Graham, Karen L., 300,203, Cl. D8-302.000.
Halsted, Milt J.; and Graham, Karen L., 300,204, Cl. D8-302.000.

L. A. Gear, Inc.: *See*—
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LaCelle, Leroy J.; Ungar, Joseph L.; and Selke, Gary J., to Advanced Technology Laboratories, Inc. Medical ultrasound scanner. 300,241, 3-14-89, Cl. D24-1.100.

Lane, Johnie P. Holder for permanent wave curling rods. 300,266, 3-14-89, Cl. D28-11.000.

Lee, Ching-Chang. Pen. 300,229, 3-14-89, Cl. D19-41.000.

Lee, Peter F., to Southland Instruments, Inc. Disposable biopsy needle unit. 300,243, 3-14-89, Cl. D24-24.000.

Lee, Wilton W.: *See*—
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Lentz, Eberhard, to Siemens Aktiengesellschaft. Personal computer. 300,219, 3-14-89, Cl. D14-106.000.

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Brown, Jeffrey M.; Lepore, George S.; Scancarella, Neil D.; and Smith, Douglas B., 300,265, Cl. D28-7.000.

Leviton Manufacturing Company, Inc.: *See*—
Brenner, Stanley S.; and Chase, Charles, 300,215, Cl. D13-25.000.

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Lungstrom, Kjell, to ABL Arbetsbelysning AB. Combined housing and mounting bracket for vehicle lamp or mirror. 300,259, 3-14-89, Cl. D26-28.000.

Markson, Richard, to Advertising Display Company. Frame for holding linoleum sample. 300,186, 3-14-89, Cl. D6-300.000.

Masco Corporation of Indiana: *See*—
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Mattson, Jeanette; and Unger, Steve A., to Syracuse China Corporation. Decalcomania for china dinnerware or similar articles. 300,196, 3-14-89, Cl. D7-39.000.

McCormick, Janet G., to Nail Concepts, Inc. Fingernail form. 300,267, 3-14-89, Cl. D28-56.000.

Meheen, H. Joe. Retaining wall with tie-back elements. 300,250, 3-14-89, Cl. D25-58.000.

Minneman, Steve W., to MTM Molded Products Company. Bow hunter's accessory box. 300,183, 3-14-89, Cl. D3-38.000.

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Sakuma, Kiyoshi; Tanimura, Yoshiaki; Umemura, Hiroyuki; Yamada, Makoto; Tsukamoto, Ikuo; Seshimo, Yu; and Fujii, Masao, 300,240, Cl. D23-314.000.

Morozumi, Kiyotaka, to Ricoh Company, Ltd. Electrostatic copier. 300,225, 3-14-89, Cl. D18-37.000.

Morrell, James I. Pet dish. 300,278, 3-14-89, Cl. 119-61.000.

Morrison, Donald L.; and Schlundt, David W., to Standard Oil Company, The. Rolling shutter valance. 300,249, 3-14-89, Cl. D25-49.000.

MTM Molded Products Company: *See*—
Minneman, Steve W., 300,183, Cl. D3-38.000.

Murata, Kinichi: *See*—
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Myojo, Seiji, to Shimano Industrial Company Limited. Fishing reel. 300,237, 3-14-89, Cl. D22-141.000.

Nail Concepts, Inc.: *See*—
McCormick, Janet G., 300,267, Cl. D28-56.000.

Nakao, Kazuhiko: *See*—
Umehara, Nobuhiro; Nishite, Yoshitoyo; Nakao, Kazuhiko; and Udagawa, Junichi, 300,279, Cl. D32-6.000.

Navarro, Maria C.; Godsey, James H.; and Tepper, Richard G., to Sherwood Medical Company. Microbiological test tray carrier. 300,245, 3-14-89, Cl. D24-31.000.
Nicotra, William A. Pool cue guide. 300,235, 3-14-89, Cl. D21-232.000.
Nishite, Yoshitoyo: *See—*
Umehara, Nobuhiro; Nishite, Yoshitoyo; Nakao, Kazuhiko; and Udagawa, Junichi, 300,279, Cl. D32-6.000.
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Noguchi, Isoroku, to Aurora Impex Corporation. Electronic calculator. 300,227, 3-14-89, Cl. D18-2.000.
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Tsuji, Masao, 300,213, Cl. D13-6.000.
Odahara, Tetsuichi; Eguchi, Jutaro; and Murata, Kinichi, to Kubota, Ltd. Combine harvester. 300,221, 3-14-89, Cl. D15-24.000.
Orejola, Wilmo C. Surgical tool for piercing and stitching sterna or the like. 300,244, 3-14-89, Cl. D24-28.000.
Pitzer, David B.; and Pitzer, R. Knox. Drinking mug. 300,195, 3-14-89, Cl. D7-5.000.
Pitzer, R. Knox: *See—*
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Rally Manufacturing, Inc.: *See—*
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Ramp, Robert H., to Bausch & Lomb Incorporated. Pair of sunglasses or the like. 300,226, 3-14-89, Cl. D16-102.000.
Rhoa, Gregory A.; and Shah, Pravinchandra B., to Rorer Pharmaceutical Corporation. Pharmaceutical tablet. 300,264, 3-14-89, Cl. D28-2.000.
Ricoh Company, Ltd.: *See—*
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Rorer Pharmaceutical Corporation: *See—*
Rhoa, Gregory A.; and Shah, Pravinchandra B., 300,264, Cl. D28-2.000.
Rubarth, Wesley B. Clamp-on candle hurricane lamp. 300,258, 3-14-89, Cl. D26-11.000.
Rudolph, Hans; and Rudolph, Kevin A., to Hans Rudolph, Inc. Four-way T-shaped respiratory valve. 300,270, 3-14-89, Cl. D29-7.000.
Rudolph, Hans; and Rudolph, Kevin A., to Hans Rudolph Inc. Three-way T-shaped respiratory valve with single balloon. 300,271, 3-14-89, Cl. D29-7.000.
Rudolph, Hans; and Rudolph, Kevin A., to Hans Rudolph, Inc. Three-way T-shaped respiratory valve with dual balloon. 300,272, 3-14-89, Cl. D29-7.000.
Rudolph, Hans; and Rudolph, Kevin A., to Hans Rudolph Inc. Four way respiratory valve with dual balloon. 300,273, 3-14-89, Cl. D29-7.000.
Rudolph, Hans; and Rudolph, Kevin A., to Hans Rudolph, Inc. Four way respiratory valve. 300,274, 3-14-89, Cl. D29-7.000.
Rudolph, Kevin A.: *See—*
Rudolph, Hans; and Rudolph, Kevin A., 300,270, Cl. D29-7.000.
Rudolph, Hans; and Rudolph, Kevin A., 300,271, Cl. D29-7.000.
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Rudolph, Hans; and Rudolph, Kevin A., 300,273, Cl. D29-7.000.
Rudolph, Hans; and Rudolph, Kevin A., 300,274, Cl. D29-7.000.
Rutherford, William, to Fioris Pty. Ltd. Longitudinal framework for a screening apparatus used in grading ore or the like. 300,222, 3-14-89, Cl. D15-28.000.
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Salerno, Arthur. Lift chair for use primarily by the invalid and elderly. 300,188, 3-14-89, Cl. D6-370.000.
Sanyei Electric Co. (HK) Ltd.: *See—*
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Schmidt, Dietrich F., to Capitol Products Corporation. Frame member for windows. 300,256, 3-14-89, Cl. D25-119.000.
Schmitt, Thomas J., to Emerson Electric Co. Molded step ladder top. 300,252, 3-14-89, Cl. D25-68.000.
Schold, Carl C.; and Comeau, Romeo J. Dry wall grinding machine. 300,224, 3-14-89, Cl. D15-124.000.
Schremmer, Paul M., to Byrne & Davidson Doors (N.S.W.) Pty. Limited. Control unit. 300,220, 3-14-89, Cl. D14-218.000.
Segeren, Walter E. Finger-mounted light. 300,260, 3-14-89, Cl. D26-39.000.
Selke, Gary J.: *See—*
LaCelle, Leroy J.; Ungar, Joseph L.; and Selke, Gary J., 300,241, Cl. D24-1.100.
Seshimo, Yu: *See—*
Sakuma, Kiyoshi; Tanimura, Yoshiaki; Umemura, Hiroyuki; Yamada, Makoto; Tsukamoto, Ikuo; Seshimo, Yu; and Fujii, Masao, 300,240, Cl. D23-314.000.
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Shimano Industrial Company Limited: *See—*
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Shwisha, Haim, to Electrix, Inc. Adjustable lamp. 300,261, 3-14-89, Cl. D26-63.000.
Siemens Aktiengesellschaft: *See—*
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Skrypalle, Ulrich, 300,218, Cl. D14-138.000.
Sjogren, Stig O.; and Johansson, Rolf A. G., to Aktiebolaget Electrolux. Helmet. 300,275, 3-14-89, Cl. D29-14.000.
Skrypalle, Ulrich, to Siemens Aktiengesellschaft. Portable radio telephone communications instrument. 300,218, 3-14-89, Cl. D14-138.000.
Smith, Douglas B.: *See—*
Brown, Jeffrey M.; Lepore, George S.; Scancarella, Neil D.; and Smith, Douglas B., 300,265, Cl. D28-7.000.
Southland Instruments, Inc.: *See—*
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Spangler, Anthony G., to Masco Corporation of Indiana. Faucet handle. 300,239, 3-14-89, Cl. D23-252.000.
Sporloisirs S.A.: *See—*
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Stahl, Kermit E., to CertainTeed Corporation. Butt segment of a shingle. 300,257, 3-14-89, Cl. D25-139.000.
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Suman, Andriano, to Giorgetti S.P.A. Folding chair. 300,187, 3-14-89, Cl. D6-368.000.
Suzuki, Sigeru, to Sanyei Electric Co. (HK) Ltd. Shoe polisher. 300,185, 3-14-89, Cl. D4-102.000.
Syracuse China Corporation: *See—*
Mattson, Jeanette; and Unger, Steve A., 300,196, Cl. D7-39.000.
Taffin de Givenchy, Philippe H.: *See—*
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Tanimura, Yoshiaki: *See—*
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Taylor, Terry L.: *See—*
Finsilver, Charles E.; Taylor, Terry L.; and Roccaforte, Harry, 300,209, Cl. D9-431.000.
Tepper, Richard G.: *See—*
Navarro, Maria C.; Godsey, James H.; and Tepper, Richard G., 300,245, Cl. D24-31.000.
Timex Corporation: *See—*
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Tingle, Joseph R. Combined fish and bait cutting tray. 300,197, 3-14-89, Cl. D7-46.000.
Tsuji, Masao, to North American Philips Corporation. Under-cabinet can opener. 300,201, 3-14-89, Cl. D8-37.000.
Tsuji, Masao, to North American Philips Corp. Charger base for a battery operated electric knife. 300,213, 3-14-89, Cl. D13-6.000.
Tsukamoto, Ikuo: *See—*
Sakuma, Kiyoshi; Tanimura, Yoshiaki; Umemura, Hiroyuki; Yamada, Makoto; Tsukamoto, Ikuo; Seshimo, Yu; and Fujii, Masao, 300,240, Cl. D23-314.000.
Tsukui, Hiroaki: *See—*
Yamase, Shinichi; Tsukui, Hiroaki; and Aoyama, Yoshihiko, 300,211, Cl. D12-110.000.
Udagawa, Junichi: *See—*
Umehara, Nobuhiro; Nishite, Yoshitoyo; Nakao, Kazuhiko; and Udagawa, Junichi, 300,279, Cl. D32-6.000.
Umehara, Nobuhiro; Nishite, Yoshitoyo; Nakao, Kazuhiko; and Udagawa, Junichi, to Kabushiki Kaisha Toshiba. Washing machine. 300,279, 3-14-89, Cl. D32-6.000.
Umemura, Hiroyuki: *See—*
Sakuma, Kiyoshi; Tanimura, Yoshiaki; Umemura, Hiroyuki; Yamada, Makoto; Tsukamoto, Ikuo; Seshimo, Yu; and Fujii, Masao, 300,240, Cl. D23-314.000.
Ungar, Joseph L.: *See—*
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Unger, Steve A.: *See—*
Mattson, Jeanette; and Unger, Steve A., 300,196, Cl. D7-39.000.
Vazquez, Thomas; and Ferguson, John D., to Armor All Products Corporation. Bottle or similar article. 300,208, 3-14-89, Cl. D9-378.000.
Vignot, Eric, to Alpha-Systems. Liquid-soap dispenser. 300,193, 3-14-89, Cl. D6-542.000.
Walker, Robert A. Air mattress. 300,194, 3-14-89, Cl. D6-604.000.
Walsh, Norma E. Hanging modular planter. 300,191, 3-14-89, Cl. D6-514.000.
Walsh, Norma E. Hanging modular planter. 300,192, 3-14-89, Cl. D6-514.000.
Walter Henkels GmbH: *See—*
Holterscheidt, Siegfried, 300,268, Cl. D28-61.000.
Watson, Welby A. E. Reel for tightening filaments. 300,205, 3-14-89, Cl. D8-358.000.
Yamada, Makoto: *See—*
Sakuma, Kiyoshi; Tanimura, Yoshiaki; Umemura, Hiroyuki; Yamada, Makoto; Tsukamoto, Ikuo; Seshimo, Yu; and Fujii, Masao, 300,240, Cl. D23-314.000.
Yamase, Shinichi; Tsukui, Hiroaki; and Aoyama, Yoshihiko, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. 300,211, 3-14-89, Cl. D12-110.000.
Yamazaki, Takashi, to Johoku Kogyo Kabushiki Kaisha. Combined tape dispenser and cutter blade. 300,230. 3-14-89, Cl. D19-69.000.

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Armstrong Roses: *See*—
Carruth, Thomas F.; and Christensen, Jack E., 6,670, Cl. 29.000.
Bradford, Lowell G.: *See*—
Bradford, Norman G.; and Bradford, Lowell G., 6,675, Cl. 41.000.
Bradford, Norman G.; and Bradford, Lowell G. Nectarine tree (Sparkling May). 6,675, 3-14-89, Cl. 41.000.
Carruth, Thomas F.; and Christensen, Jack E., to Armstrong Roses. Floribunda rose plant cv. Aroresas. 6,670, 3-14-89, Cl. 29.000.
Christensen, Jack E.: *See*—
Carruth, Thomas F.; and Christensen, Jack E., 6,670, Cl. 29.000.
Colorado State University Research Foundation: *See*—
Goldsberry, Kenneth L., 6,663, Cl. 71.000.
Fiala, John L., to New Plants. Flowering crab apple tree named Mazam. 6,672, 3-14-89, Cl. 34.000.
Goldsberry, Kenneth L., to Colorado State University Research Foundation. Dwarf carnation plant 'Sneffels'. 6,663, 3-14-89, Cl. 71.000.
Hansche, Paul E., to University of California, The Regents of the. Peach tree called Valley Red. 6,671, 3-14-89, Cl. 43.000.
Hansche, Paul E., to University of California, The Regents of the. Cherry tree named Brooks. 6,676, 3-14-89, Cl. 37.000.
Hoy, Lowell L., Jr., to Joseph H. Hill Company. Rose plant seedling named Charade. 6,669, 3-14-89, Cl. 28.000.
Jackson & Perkins Company: *See*—
Warriner, William A., 6,664, Cl. 18.000.
Warriner, William A., 6,665, Cl. 10.000.
Warriner, William A., 6,666, Cl. 1.000.
Warriner, William A., 6,667, Cl. 17.000.
Warriner, William A., 6,668, Cl. 17.000.
Joseph H. Hill Company: *See*—
Hoy, Lowell L., Jr., 6,669, Cl. 28.000.
Lanari, Fernand, to Selecta Klemm K.G. Carnation named Lanaric. 6,662, 3-14-89, Cl. 71.000.
New Plants: *See*—
Fiala, John L., 6,672, Cl. 34.000.
Selecta Klemm K.G.: *See*—
Lanari, Fernand, 6,662, Cl. 71.000.
University of California, The Regents of the: *See*—
Hansche, Paul E., 6,671, Cl. 43.000.
Hansche, Paul E., 6,676, Cl. 37.000.
van Zelderen, Gerard J. Alstroemeria named Zelblanca. 6,661, 3-14-89, Cl. 68.000.
Wallace, Robert D. Heritage chestnut. 6,674, 3-14-89, Cl. 30.000.
Warriner, William A., to Jackson & Perkins Company. Rose plant Jacglow. 6,664, 3-14-89, Cl. 18.000.
Warriner, William A., to Jackson & Perkins Company. Rose plant Jacrem. 6,665, 3-14-89, Cl. 10.000.
Warriner, William A., to Jackson & Perkins Company. Rose plant Jacsnow. 6,666, 3-14-89, Cl. 1.000.
Warriner, William A., to Jackson & Perkins Company. Rose plant Jaccob. 6,667, 3-14-89, Cl. 17.000.
Warriner, William A., to Jackson & Perkins Company. Rose plant Jacbor. 6,668, 3-14-89, Cl. 17.000.
Williams, Ernest D. Miniature rose plant/Minadco. 6,673, 3-14-89, Cl. 7.000.

CLASSIFICATION OF PATENTS

ISSUED MARCH 14, 1989

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2	4,811,427
49 R	4,811,428
83	4,811,429
452	4,811,430

CLASS 4

191	4,811,431
325	4,811,432
502	4,811,433
543	4,811,434

CLASS 5

60	4,811,435
93 R	4,811,436
99 B	4,811,437
308	4,811,438
475	4,811,439

CLASS 7

100	4,811,440
158	4,811,441

CLASS 8

490	4,812,139
492	4,812,140
506	4,812,141
512	4,812,142
528	4,812,143
584	4,812,144

CLASS 15

82	4,811,442
97.1	4,811,443
104 A	4,811,444
104.94	4,811,445
147 R	4,811,446
159 A	4,811,447
211	4,811,448
231	4,811,449
250.04	4,811,451
337	4,811,450
	4,811,452
347	4,811,453

CLASS 16

82	4,811,454
97	4,811,683
197	4,811,455

CLASS 17

1 G	4,811,456
11	4,811,457
11.1 R	4,811,458
21	4,811,459
51	4,811,460
56	4,811,461
62	4,811,462

CLASS 19

105	4,811,463
107	4,811,464

CLASS 24

30.5 R	4,811,465
115.G	4,811,466
241 PS	4,811,467
442	4,811,468
453	4,811,470
664	4,811,469

CLASS 29

156.4 R	4,811,471
159 B	4,811,472
430	4,811,473
446	4,811,474
521	4,811,475
603	4,811,476
605	4,811,477
613	4,811,478
618	4,811,479
623.1	4,812,145
809	4,811,480
825	4,811,481
848	4,811,482

CLASS 30

43.6	4,811,483
	4,811,484
90.1	4,811,485
161	4,811,486
382	4,811,487
391	4,811,488

CLASS 33

179.5 R	4,811,490
366	4,811,491
	4,811,492
759	4,811,489

CLASS 34

4	4,811,493
9	4,811,494
131	4,811,495
144	4,811,496

CLASS 36

10	4,811,499
51	4,811,497
91	4,811,500
94	4,811,501
117	4,811,498
	4,811,502
119	4,811,503
132	4,811,504

CLASS 37

142 R	4,811,505

CLASS 40

427	4,811,506
546	4,811,507
607	4,811,508

CLASS 42

42.01	4,811,509
50	4,811,510
70.06	4,811,511

CLASS 43

17	4,811,512
17.6	4,811,513
19.2	4,811,514
26.1	4,811,515

CLASS 44

77	4,812,146

CLASS 49

49	4,811,516
145	4,811,517
193	4,811,518
375	4,811,519
409	4,811,520

CLASS 51

5 D	4,811,521
131.1	4,811,522
	4,811,523
165 R	4,811,524
166 MH	4,811,525
270	4,811,526
	4,811,527
287	4,811,528

CLASS 52

6	4,811,530
127.5	4,811,531
172	4,811,532
211	4,811,533
219	4,811,534
249	4,811,535
250	4,811,536
309.12	4,811,770
385	4,811,537
396	4,811,529
455	4,811,538
486	4,811,539
630	4,811,540
737	4,811,541
741	4,811,542
	4,811,543

CLASS 53

64	4,811,544
138 A	4,811,545
266 R	4,811,546
	4,811,547
409	4,811,548
428	4,811,549
478	4,811,550
500	4,811,551

CLASS 55

25	4,812,147
71	4,812,149
162	4,812,148

CLASS 56

11.8	4,811,552
13.6	4,811,553

CLASS 57

401	4,811,554

CLASS 60

39.06	4,811,555
206	4,811,556
274	4,811,557
281	4,811,558
303	4,811,559
310	4,811,560
368	4,811,561
370	4,811,562
517	4,811,563
527	4,811,564
646	4,811,565
	4,811,566

CLASS 62

129	4,811,567
200	4,811,568
239	4,811,569
263	4,811,570
474	4,811,571

CLASS 65

3.11	4,812,150
	4,812,154
3.12	4,812,153
	4,812,155
29	4,812,151
83	4,812,156
120	4,812,152
273	4,812,157

CLASS 66

13	4,811,572
193	4,811,573

CLASS 68

5 D	4,811,574

CLASS 69

19.3	4,811,576

CLASS 70

14	4,811,577
16	4,811,775
38 B	4,811,578
85	4,811,579
218	4,811,580

CLASS 71

16	4,812,159
64.12	4,812,158
88	4,812,160
90	4,812,161
	4,812,162
92	4,812,163
	4,812,164
	4,812,165

CLASS 72

14	4,811,581
16	4,811,582
38	4,811,583
63	4,811,584
108	4,811,585
165	4,811,586
181	4,811,587
202	4,811,588
389	4,811,589
482	4,811,590

CLASS 73

9	4,811,591
29 B	4,811,601
32 A	4,811,592
54	4,811,593
105	4,811,594
149	4,811,595
	4,811,596
151	4,811,597
154	4,811,598
155	4,811,599
272 R	4,811,600
493	4,811,603
505	4,811,602
517 R	4,811,604
645	4,811,605
861.38	4,811,606
861.53	4,811,607
862.04	4,811,608
862.34	4,811,612
862.36	4,811,609
862.65	4,811,610
864.22	4,811,611

CLASS 74

5.6 D	4,811,613
15.63	4,811,614
89.15	4,811,618
331	4,811,655
375	4,811,615
421 A	4,811,616
422	4,811,617
424.8 B	4,811,619
474	4,811,620
501.5 R	4,811,621
525	4,811,622
534.1	4,811,626
547	4,811,623
571 L	4,811,624
572	4,811,625
665 L	4,811,627
710.5	4,811,628
	4,811,629
752 A	4,811,630
762	4,811,631

CLASS 75

0.5 C	4,812,166
63	4,812,167
68 A	4,812,168

CLASS 76

101 A	4,811,632

CLASS 81

9.51	4,811,633
21	4,811,634
57.33	4,811,635
63.2	4,811,636
125	4,811,647
177.2	4,811,637
	4,811,638

CLASS 82

110	4,811,639

CLASS 83

13	4,811,640
105	4,811,641
574	4,811,642
745	4,811,643

CLASS 84

1.2	4,811,644
207	4,811,645
313	4,811,646

CLASS 89

14.3	4,811,648

CLASS 91

47	4,811,649
461	4,811,650

CLASS 92

29	4,811,651
92	4,811,652
98 D	4,811,653
216	4,811,654

CLASS 98

37	4,811,656
41.1	4,811,575

CLASS 99

295	4,811,657
455	4,811,658

CLASS 100

118	4,811,659
229 A	4,811,660

CLASS 101

147	4,811,661
170	4,811,662
183	4,811,663
375	4,812,219

CLASS 102

217	Re.32,888
226	4,811,664
427	4,811,665
501	4,811,666

CLASS 104

284	4,811,667

CLASS 105

4.1	4,811,668
30	4,811,669

CLASS 106

15.05	4,812,169
21	4,812,171
122	4,812,170

CLASS 108

107	4,811,670

CLASS 112

121.26	4,811,671
128	4,811,672
445	4,811,673

CLASS 114

39.2	4,811,674
56	4,811,676
89	4,811,677
103	4,811,678
144 RE	4,811,679
201 R	4,811,680
267	4,811,681
345	4,811,682

CLASS 118

50.1	4,811,684
326	4,811,685
624	4,811,689
657	4,811,686
666	4,811,687
674	4,811,688
723	4,811,690
726	4,811,691

CLASS 119

3	4,811,692
15	4,811,693
52 B	4,811,675
52 R	4,811,694
106	4,811,695

CLASS 122

4 D	4,811,696

CLASS 123

52 MV	4,811,697
90.17	4,811,698
90.23	4,811,699
188 AA	4,811,701
188 M	4,811,702
188 P	4,811,703
	4,811,704
195 AC	4,811,705
196 R	4,811,706
198 E	4,811,700
272	4,811,707
299	4,811,708
357	4,811,709
359	4,811,710
	4,811,711
399	4,811,712
	4,811,713
425	4,811,714
447	4,811,715
503	4,811,716
509	4,811,717
517	4,811,718
527	4,811,720
557	4,811,719

CLASS 125

11 CD	4,811,721
11 R	4,811,722

CLASS 126

113	4,811,723
299 D	4,811,724

CLASS 128

24 A	4,811,725
57	4,811,726
80 R	4,811,727
201.25	4,811,728
202.12	4,811,729
203.11	4,811,730
203.15	4,811,731
204.26	4,811,732
303.14	4,811,733
305	4,811,734
	4,811,735
305.1	4,811,736
344	4,811,737
419 PG	4,811,738
660.01	4,811,740
664	4,811,739
691	4,811,741
733	4,811,742
772	4,811,743

CLASS 131

84.1	4,811,744
342	4,811,745
359	4,811,746

CLASS 132

203	4,811,747

CLASS 134

22.1	4,812,172
27	4,812,173
122 R	4,811,748
184	4,811,749

CLASS 135

66	4,811,750
106	4,811,751

CLASS 137

77	4,811,752
217	4,811,753
218	4,811,754
486	4,811,755
498	4,811,756
514.5	4,811,757
844	4,811,758

CLASS 138

89	4,811,759
115	4,811,760
122	4,811,761

CLASS 139

452	4,811,762

CLASS 141

44	4,811,763
98	4,811,764
392	4,811,765

CLASS 144

357	4,811,776

CLASS 148

11.5 A	4,811,766
12 EA	4,812,176
	4,812,177
12.7 A	4,812,178
121	4,812,181
251	4,812,174
256	4,812,175
330	4,812,182
439	4,812,183

CLASS 149

19.2	4,812,179
19.5	4,812,180

CLASS 150

102	4,811,768
113	4,811,769
154	4,811,767

CLASS 152

454	4,811,771
540	4,811,772
543	4,811,773

CLASS 156

84	4,812,184
86	4,812,185
90	4,812,186
201	4,812,189
220	4,812,188
221	4,812,190
239	4,812,191
245	4,812,187
251	4,812,192
293	4,812,193
307.3	4,812,194
357	4,812,195
412	4,812,196

415 4,812,197
497 4,812,198
626 4,812,199
628 4,812,202
643 4,812,200
4,812,201

CLASS 157

1.1 4,811,774

CLASS 159

6.2 4,812,203

CLASS 160

201 4,811,777

CLASS 162

3 4,812,204
4 4,812,205
19 4,812,206
29 4,812,207
343 4,812,208
4,812,209

CLASS 164

418 4,811,779
428 4,811,780
480 4,811,781
495 4,811,782
516 4,811,778

CLASS 165

134.1 4,811,783

CLASS 166

208 4,811,784
242 4,811,785
246 4,811,788
273 4,811,787
276 4,811,789
278 4,811,790
303 4,811,786
305.1 4,811,791
381 4,811,792

CLASS 169

48 4,811,793
62 4,811,796

CLASS 172

43 4,811,794
456 4,811,795

CLASS 173

93.6 4,811,797

CLASS 174

94 R 4,812,601

CLASS 175

73 4,811,798
209 4,811,799
323 4,811,800
329 4,811,801

CLASS 177

1 4,811,802

CLASS 180

7.5 4,811,803
53.8 4,811,804
79.1 4,811,813
140 4,811,805
141 4,811,806
4,811,807
197 4,811,808
4,811,809
215 4,811,810
244 4,811,811
295 4,811,812

CLASS 181

108 4,811,814
120 4,811,815
160 4,811,816

CLASS 182

37 4,811,819
76 4,811,817

CLASS 184

3.2 4,811,818

CLASS 188

71.6 4,811,820
79.62 4,811,821
264 A 4,811,822

CLASS 192

0.076 4,811,827
21.5 4,811,823
35 4,811,824
53 F 4,811,825
70.13 4,811,826

CLASS 194

351 4,811,828

CLASS 198

326 4,811,829
372 4,811,830
394 4,811,831
443 4,811,832
499 4,811,833
621 4,811,834
762 4,811,835

CLASS 200

80 R 4,812,602
260 4,812,604
284 4,812,605
570 4,812,603

CLASS 204

1 T 4,812,210
15 4,812,213
147 4,812,212
157.74 4,812,214
180.2 4,812,211
181.7 4,812,215
182.8 4,812,216
192.12 4,812,217
192.27 4,812,218
403 4,812,220
412 4,812,221

CLASS 206

3 4,811,836
45.11 4,811,837
219 4,811,838
303 4,811,839
320 4,811,840
349 4,811,843
423 4,811,841
443 4,811,842
459 4,811,844
534 4,811,845
542 4,811,846
571 4,811,847
610 4,811,848
621.2 4,811,849

CLASS 208

13 4,812,225
89 4,812,222
111 4,812,223
4,812,224
120 4,812,226
215 4,812,227
251 H 4,812,228

CLASS 209

397 4,812,229
546 4,811,850

CLASS 210

108 4,812,230
158 4,812,231
177 4,812,233
181 4,812,232
195.3 4,812,234
247 4,812,235
490 4,812,236
605 4,812,237
636 4,812,238
639 4,812,240
647 4,812,239
658 4,812,241
735 4,812,242
761 4,812,243

CLASS 211

41 4,811,851
119 4,811,852
124 4,811,853

CLASS 213

155 4,811,854

CLASS 215

13.1 4,811,858
243 4,811,855
250 4,811,856
329 4,811,857

CLASS 219

10.55 B 4,812,606
4,812,607
10.55 R 4,812,617
10.75 4,812,608
10.81 4,812,609
70 4,812,610
74 4,812,611
89 4,812,612
121.74 4,812,613
124.34 4,812,614
209 4,812,615
222 4,812,616
288 4,812,618
4,812,619
347 4,812,620
366 4,812,621
400 4,812,622
437 4,812,623
450 4,812,624
497 4,812,625
523 4,812,626

CLASS 220

224 4,811,859
380 4,811,860

CLASS 221

197 4,811,861

CLASS 222

63 4,811,862
146.5 4,811,863
148 4,811,864
153 4,811,865
189 4,811,866
231 4,811,867
440 4,811,869
461 4,811,870
462.2 4,811,868
477 4,811,871
610 4,811,872

CLASS 223

32 4,811,873

CLASS 224

42.21 4,811,874
42.44 4,811,875
264 4,811,876
321 4,811,877

CLASS 225

46 4,811,878

CLASS 226

136 4,811,879
197 4,811,880

CLASS 227

4 4,811,881
8 4,811,882
10 4,811,883
19 4,811,886
83 4,811,884
131 4,811,885

CLASS 228

2 4,811,887
148 4,811,888
4,811,889
157 4,811,890
182 4,811,891
194 4,811,892
198 4,811,893

CLASS 229

52 B 4,811,894
89 4,811,896

CLASS 232

35 4,811,895

CLASS 235

377 4,812,627
380 4,812,628
383 4,812,629
448 4,812,630
467 4,812,631
479 4,812,632
487 4,812,633
492 4,812,634

CLASS 236

49 4,811,897

CLASS 239

3 4,811,898
5 4,811,899
10 4,811,900
138 4,811,901
240 4,811,902
284.2 4,811,903
345 4,811,904
585 4,811,905
703 4,811,906

CLASS 241

5 4,811,907
21 4,811,908
33 4,811,909

CLASS 242

18 R 4,811,910
55.2 4,811,918
56 R 4,811,911
56.1 4,811,914
66 4,811,915
84.2 R 4,811,916
107.4 B 4,811,912
107.6 4,811,913
118.1 4,811,917

CLASS 244

54 4,811,919
145 4,811,920
234 4,811,921

CLASS 248

73 4,811,922
278 4,811,923
352 4,811,924
430 4,811,925
488 4,811,926

CLASS 249

210 4,811,927

CLASS 250

201 Re.32,886
4,812,636
4,812,637
4,812,638
203 R 4,812,639
204 4,812,640
205 4,812,641
221 4,812,642
222.1 4,812,643
223 R 4,812,644
227 4,812,645
4,812,646
4,812,647
231 R 4,812,635
255 4,812,648
296 4,812,649
307 4,812,650
310 4,812,651
311 4,812,652
338.1 4,812,653
4,812,654
352 4,812,655
363 R 4,812,656
372 4,812,657
396 R 4,812,658
484.1 4,812,659
4,812,660
491.1 4,812,661
4,812,662
492.2 R 4,812,663
561 4,812,666
571 4,812,665
572 4,812,664
578 4,812,667
4,812,668

CLASS 251

7 4,811,928
122 4,811,929

CLASS 252

8.514 4,812,244
17 4,812,245
32.7 E 4,812,246
51.5 A 4,812,261
56 R 4,812,248
62.52 4,812,249
67 4,812,250
75 4,812,251
108 4,812,252
132 4,812,253
135 4,812,254
142 4,812,255
162 4,812,256
182.32 4,812,257
299.61 4,812,258
299.65 4,812,259
378 R 4,812,260
511 4,812,247
567 4,812,262

CLASS 254

45 4,811,930
134 4,811,931

CLASS 260

404.5 Q 4,812,263
544 L 4,812,264

CLASS 261

70 4,812,265
71 4,812,266

CLASS 264

40.1 4,812,268
41 4,812,269
48 4,812,270
63 4,812,271
65 4,812,272
71 4,812,273
80 4,812,274
129 4,812,275
169 4,812,267
177.11 4,812,276
185 4,812,277
221 4,812,278
311 4,812,279
332 4,812,280
502 4,812,281
518 4,812,283
540 4,812,282
555 4,812,284

CLASS 267

95 4,811,932
140.1 4,811,933
4,811,934

CLASS 269

34 4,811,935
43 4,811,936
327 4,811,937

CLASS 270

54 4,811,938

CLASS 271

146 4,811,939
155 4,811,940

CLASS 272

33 R 4,811,942
56.5 R 4,811,943
67 4,811,944
70 4,811,941
73 4,811,945
129 4,811,946

CLASS 273

73 J 4,811,947
156 4,811,948
157 R 4,811,951
171 4,811,949
4,811,950
258 4,811,952
265 4,811,953
283 4,811,954
310 4,811,955
407 4,811,956

CLASS 277

1 4,811,957
12 4,811,958
124 4,811,959
153 4,811,960
199 4,811,961

CLASS 279

2 A 4,811,962
5 4,811,963

CLASS 280

5.32 4,811,966
87.041 4,811,971
250.1 4,811,964
455.1 4,811,965
479.3 4,811,967
652 4,811,968
683 4,811,972
701 4,811,969
788 4,811,970

CLASS 281

21 A 4,811,973

CLASS 283

67 4,811,974

CLASS 285

305 4,811,975
328 4,811,976

CLASS 292

307 A 4,811,977
323 4,811,978

CLASS 293

102 4,811,979

CLASS 294

19.2 4,811,980

CLASS 296

37.12 4,811,981
95.1 4,811,982
97.22 4,811,984
190 4,811,983
214 4,811,985

CLASS 297

284 4,811,986
440 4,811,987

CLASS 298

2 4,811,988

CLASS 300

21 4,811,989
4,811,990

CLASS 301

37 R 4,811,991
105 R 4,811,992

CLASS 303

14 4,812,777
100 4,811,993
115 4,811,994

CLASS 307

10.1 4,812,671
10.2 4,812,670
64 4,812,672
105 4,812,669
106 4,812,673
116 4,812,674
272.1 4,812,679
290 4,812,676
296 R 4,812,677
350 4,812,680
362 4,812,681
425 4,812,682
443 4,812,675
4,812,678
448 4,812,683
480 4,812,684
481 4,812,685
491 4,812,686
601 4,812,687
605 4,812,688
4,812,689

CLASS 310

27 4,812,690
41 4,812,691
49 R 4,812,692
71 4,812,693
90.5 4,812,694
216 4,812,696
258 4,812,695
316 4,812,699
323 4,812,697
330 4,812,698

CLASS 312

1 4,812,700
15 4,811,995
132 4,811,996
228 4,811,997
229 4,811,998
250 4,811,999
285 4,812,701

CLASS 313

153 4,812,702
318 4,812,703
402 4,812,704
406 4,812,705
414 4,812,706
435 4,812,707
477 R 4,812,708
478 4,812,709
579 4,812,710

CLASS 315

60 4,812,714
111.91 4,812,711
176 4,812,712
340 4,812,715
366 4,812,716
367 4,812,717
370 4,812,713
382 4,812,718
411 4,812,719
4,812,720

CLASS 318

66 4,812,721
488 4,812,723
561 4,812,722
599 4,812,724
625 4,812,725
640 4,812,726
696 4,812,727
732 4,812,729
4,812,730
760 4,812,728
800 4,812,731

CLASS 322

99 4,812,732

CLASS 323

224 4,812,736
271 4,812,737
285 4,812,733
312 4,812,734
313 4,812,735

CLASS 324

58 B 4,812,738
58.5 A 4,812,739
62 4,812,740
65 P 4,812,741
73 R 4,812,742
77 R 4,812,743
106 4,812,749
115 4,812,744
121 R 4,812,746
132 4,812,747
158 F 4,812,750
4,812,754
4,812,755
158 P 4,812,745
158 R 4,812,748
4,812,756
207 4,812,757
209 4,812,758
226 4,812,759
244 4,812,767
307 4,812,753
4,812,761
309 4,812,760
4,812,762
316 4,812,763
318 4,812,764

320 4,812,765
362 4,812,766
379 4,812,768
542 4,812,752
546 4,812,751

CLASS 328

63 4,812,769
67 4,812,770
[illegible] 4,812,771
145 4,812,772
167 4,812,773
233 4,812,774
4,812,775

CLASS 330

4.3 4,812,776
51 4,812,778
149 4,812,779
253 4,812,780
254 4,812,781
286 4,812,782

CLASS 331

20 4,812,783
113 R 4,812,784
117 FE 4,812,785

CLASS 332

16 R 4,812,786

CLASS 333

1.1 4,812,787
113 4,812,788
135 4,812,789
212 4,812,790
219 4,812,791
238 4,812,792

CLASS 335

8 4,812,793
151 4,812,794
258 4,812,795
4,812,884
299 4,812,796
4,812,797

CLASS 336

98 4,812,798

CLASS 337

70 4,812,799

CLASS 338

2 4,812,800
4 4,812,801
128 4,812,802
175 4,812,803
200 4,812,804

CLASS 340

146.2 4,812,809
311.1 4,812,813
332 4,812,814
440 4,812,806
464 4,812,807
468 4,812,808
517 4,812,819
518 4,812,820
538 4,812,821
545 4,812,810
566 4,812,824
571 4,812,811
572 4,812,822
4,812,823
601 4,812,825
682 4,812,826
693 4,812,827
706 4,812,828
709 4,812,829
4,812,832
711 4,812,831
712 4,812,830
4,812,833
721 4,812,834
724 4,812,836
756 4,812,835
784 4,812,837
825.05 Re.32,887
4,812,805
825.06 4,812,838
825.14 4,812,839
825.31 4,812,841
825.5 4,812,840
825.720 4,812,842
854 4,812,812
905 4,812,843
949 4,812,844
995 4,812,845

CLASS 341

131 4,812,846
133 4,812,816
154 4,812,847
157 4,812,848
172 4,812,817

CLASS 342

22 4,812,850
194 4,812,849
389 4,812,851
457 4,812,852

CLASS 343

700 MS 4,812,853
818 4,812,855
897 4,812,854

CLASS 346

1.1 4,812,856
74.5 4,813,007
137 4,812,857
139 R 4,812,858
140 R 4,812,859
159 4,812,860

CLASS 350

6.6 4,812,000
96.18 4,812,002
4,812,003
96.20 4,812,004
4,812,005
96.21 4,812,006
4,812,007
4,812,008
4,812,009
96.22 4,812,010
96.24 4,812,012
96.29 4,812,013
4,812,014
96.3 4,812,001
96.34 4,812,011
252 4,812,015
320 4,812,016
333 4,812,017
341 4,812,018
355 4,812,019
409 4,812,020
425 4,812,021
426 4,812,022
427 4,812,023
4,812,024
435 4,812,025
444 4,812,028
454 4,812,026
463 4,812,027
523 4,812,029
620 4,812,030

CLASS 351

46 4,812,031
159 4,812,032
208 4,812,033

CLASS 354

4 4,812,861
21 4,812,862
219 4,812,863
224 4,812,864
286 4,812,865
288 4,812,866
313 4,812,867
402 4,812,868
408 4,812,869
412 4,812,870
414 4,812,872
421 4,812,871

CLASS 355

3 FU 4,812,873
7 4,812,874
4,812,875
14 R 4,812,876
4,812,877
15 4,812,878
38 4,812,879
53 4,812,880
77 4,812,881
4,812,882
91 4,812,883

CLASS 356

5 4,812,035
32 4,812,036
35 4,812,037
73.1 4,812,038
129 4,812,039
314 4,812,040
346 4,812,041
348 4,812,042
385 4,812,043

CLASS 357

22 4,812,886
23.5 4,812,885
4,812,898
24 4,812,887
26 4,812,888
34 4,812,890
35 4,812,891
38 4,812,892
39 4,812,893
42 4,812,889
55 4,812,894
69 4,812,895
70 4,812,896
72 4,812,897

CLASS 358

32 4,812,905
75 4,812,899
4,812,900
80 4,812,902
4,812,903
101 4,812,901
107 4,812,904
149 4,812,906
153 4,812,907
174 4,812,908
183 4,812,909
225 4,812,911
227 4,812,912
282 4,812,910
285 4,812,913
287 4,812,915
289 4,812,916
293 4,812,914
4,812,917
4,812,918
310 4,812,919
4,812,920
343 4,812,921

CLASS 360

10.1 4,812,922
25 4,812,923
32 4,812,924
38.1 4,812,925
70 4,812,926
75 4,812,927
77.07 4,812,929
78.08 4,812,928
84 4,812,930
97.01 4,812,932
99.06 4,812,931
105 4,812,933
106 4,812,934
4,812,935
132 4,812,936
133 4,812,937
4,812,938
135 4,812,939
137 4,812,940

CLASS 361

15 4,812,941
92 4,812,943
119 4,812,942
127 4,812,944
150 4,812,946
154 4,812,945
220 4,812,947
223 4,812,948
386 4,812,949
395 4,812,950
504 4,812,951

CLASS 362

84 4,812,952
103 4,812,953
134 4,812,954
240 4,812,955
249 4,812,956
263 4,812,957
431 4,812,958

CLASS 363

20 4,812,959
4,812,960
61 4,812,961

CLASS 364

131 4,812,963
140 4,812,964
200 4,812,966
4,812,967
4,812,968
4,812,969
4,812,970
4,812,971
4,812,972
4,812,973
4,812,974
4,812,981
4,812,989
300 4,812,975
413.06 4,812,976
413.17 4,812,983
421 4,812,978
422 4,812,977
431.01 4,812,979
444 4,812,990
449 4,812,980
458 4,812,991
464.02 4,812,992
4,812,994
470 4,812,993
474 4,812,984
478 4,812,982
4,812,985
479 4,812,986
481 4,812,995
487 4,812,996
490 4,812,962
505 4,812,997
518 4,812,998
4,812,999
522 4,812,988
526 4,813,000
550 4,812,965
553 4,813,001
557 4,813,003
567 4,813,004
580 4,813,005
604 4,813,006
724.01 4,812,987
760 4,813,008
900 4,813,009
4,813,010
4,813,011
4,813,012
4,813,013

CLASS 365

45 4,813,014
49 4,813,002
78 4,813,015
107 4,813,016
156 4,813,017
185 4,813,018
189 4,813,019
4,813,020
194 4,813,021
203 4,813,022
207 4,813,023
228 4,813,024

CLASS 366

54 4,812,044
107 4,812,045
111 4,812,046
141 4,812,047
4,812,048
174 4,812,049

CLASS 367

6 4,813,025
29 4,813,026
31 4,813,028
52 4,813,027
188 4,813,029

CLASS 368

93 4,813,030

CLASS 369

13 4,813,032
45 4,813,031
4,813,033
116 4,813,034

CLASS 370

50 4,813,035
57 4,813,036
60 4,813,037
4,813,038
89 4,813,039
111 4,813,040
112 4,813,041

CLASS 371

16 4,813,042
27 4,813,043
30 4,812,818
55 4,813,044

CLASS 372

38 4,813,045
4,813,046
4,813,047
4,813,048
44 4,813,049
45 4,813,050
64 4,813,052
86 4,813,053
96 4,813,054
150 4,813,051

CLASS 373

74 4,813,055

CLASS 374

1 4,812,050
10 4,812,051
50 4,812,052
102 4,812,053

CLASS 375

27 4,813,056
37 4,813,057
82 4,813,058
122 4,813,059

CLASS 376

203 4,812,285
282 4,812,286

CLASS 378

39 4,813,060
99 4,813,061
162 4,813,062
182 4,813,063
197 4,813,064

CLASS 379

67 4,813,067
70 4,813,068
82 4,813,069
112 4,813,065
213 4,813,070
327 4,813,071
388 4,813,072
410 4,813,073
413 4,813,066

CLASS 381

36 4,813,074
43 4,813,075
4,813,076

CLASS 382

7 4,813,077
21 4,813,078

CLASS 383

65 4,812,056
110 4,812,054
119 4,812,055
122 4,812,034

CLASS 384

42 4,812,057
563 4,812,058

CLASS 400

56 4,812,059
82 4,812,060
124 4,812,061
157.2 4,812,062
234 4,812,063
622 4,812,064
624 4,812,065

CLASS 401

78 4,812,066
132 4,812,067
195 4,812,068
4,812,069
264 4,812,071
289 4,812,070

CLASS 403

24 4,812,072
134 4,812,073
403 4,812,075

CLASS 404

108 4,812,076

CLASS 405

36 4,812,082
79 4,812,077
153 4,812,084
164 4,812,079
179 4,812,078
186 4,812,083
227 4,812,080
296 4,812,081

CLASS 406

88 4,812,085
153 4,812,086

CLASS 407

42 4,812,087

CLASS 408

130 4,812,088
139 4,812,089

CLASS 409

132 4,812,090
233 4,812,091

CLASS 410

110 4,812,093

CLASS 411

134 4,812,094
188 4,812,095
231 4,812,096
347 4,812,097
360 4,812,098

CLASS 414

199 4,812,092
4,812,100
220 4,812,101
280 4,812,102
723 4,812,103
735 4,812,104
788.2 4,812,099

CLASS 415

134 4,812,105
139 4,812,106

CLASS 416

191 4,812,107

CLASS 417

368 4,812,108
401 4,812,109

CLASS 418

1 4,812,110
20 4,812,111

CLASS 420

41 4,812,287
443 4,812,288
528 4,812,289
552 4,812,290

CLASS 422

28 4,812,291
31 4,812,292
69 4,812,293
72 4,812,294
169 4,812,295

CLASS 423

239 4,812,296
300 4,812,297
327 4,812,298
328 4,812,299
404 4,812,300
440 4,812,301
605 4,812,302

CLASS 424

44 4,812,303
52 4,812,306
4,812,308
71 4,812,307
84 4,812,309
101 4,812,310
112 4,812,304
4,812,311
417 4,812,312
448 4,812,305
4,812,313
450 4,812,314
466 4,812,315
468 4,812,316

CLASS 425

66 4,812,112
111 4,812,113
116 4,812,114
405.2 4,812,115
547 4,812,116

CLASS 426

87 4,812,317
94 4,812,318
127 4,812,319
393 4,812,320
496 4,812,323
503 4,812,321
513 4,812,322
624 4,812,324

CLASS 427

38 4,812,326
69 4,812,325
4,812,328
115 4,812,329
128 4,812,330
168 4,812,332
226 4,812,333
255.1 4,812,331
257 4,812,336
369 4,812,334
388.4 4,812,327
407.1 4,812,335
4,812,337

CLASS 428

4 4,812,338
15 4,812,339
4,812,340
24 4,812,341
34.6 4,812,344
35.4 4,812,342
35.6 4,812,343
65 4,812,345
4,812,346
77 4,812,347
113 4,812,348
138 4,812,349
141 4,812,351
142 4,812,352
151 4,812,350
172 4,812,353
195 4,812,354
215 4,812,355
220 4,812,356
246 4,812,357
323 4,812,358
332 4,812,359
4,812,367
4,812,368
337 4,812,360
397 4,812,361
407 4,812,362

CLASSIFICATION OF PATENTS

420 4,812,363
425.9 4,812,369
447 4,812,364
469 4,812,365
528 4,812,366
552 4,812,370
659 4,812,371
664 4,812,372

CLASS 429

19 4,812,373
50 4,812,374
101 4,812,375
4,812,376

CLASS 430

109 4,812,377
110 4,812,378
4,812,379
4,812,380
4,812,381
4,812,382
126 4,812,383
175 4,812,384
290 4,812,385
4,812,386
311 4,812,387
314 4,812,388
382 4,812,389
434 4,812,390
564 4,812,391

CLASS 432

9 4,812,117

CLASS 433

2 4,812,118
49 4,812,119
172 4,812,121
173 4,812,120

CLASS 434

18 4,812,122
195 4,812,123
203 4,812,124
224 4,812,125
238 4,812,126
264 4,812,127
278 4,812,128

CLASS 435

3 4,812,392
4 4,812,393
6 4,812,394
7 4,812,395
4,812,396
4,812,397
14 4,812,398
18 4,812,399
21 4,812,400
29 4,812,401
4,812,402
115 4,812,403
161 4,812,410
175 4,812,404
255 4,812,405
280 4,812,406
291 4,812,407
293 4,812,411
296 4,812,408

CLASS 436

15 4,812,412
92 4,812,413
533 4,812,414

CLASS 437

2 4,812,415
5 4,812,416
31 4,812,417
069 4,812,418
203 4,812,419
209 4,812,420
211 4,812,421

CLASS 439

79 4,812,129
84 4,812,130
110 4,812,134
134 4,812,131
164 4,812,132
248 4,812,133
493 4,812,135
589 4,812,136
607 4,812,137
865 4,812,138

CLASS 455

612 4,812,815

CLASS 493

213 4,812,074

CLASS 501

20 4,812,422
55 4,812,423
84 4,812,424
96 4,812,425
136 4,812,426
148 4,812,427
4,812,428

CLASS 502

34 4,812,429
42 4,812,430
4,812,431
112 4,812,432
117 4,812,433
178 4,812,434
227 4,812,435
243 4,812,437
407 4,812,436

CLASS 503

200 4,812,438
223 4,812,440
227 4,812,439

CLASS 514

2 4,812,441
18 4,812,442
53 4,812,444
60 4,812,445
143 4,812,443
165 4,812,446
170 4,812,447
178 4,812,448
183 4,812,449
211 4,812,450
212 4,812,451
4,812,452
4,812,456
226.2 4,812,457
226.5 4,812,455
249 4,812,458
254 4,812,459
255 4,812,453
256 4,812,454
277 4,812,460
278 4,812,461
303 4,812,462
307 4,812,573
311 4,812,463
333 4,812,464
340 4,812,465
341 4,812,467
346 4,812,468
351 4,812,466
365 4,812,470
372 4,812,471
374 4,812,472
396 4,812,473
412 4,812,475
460 4,812,474
466 4,812,469
513 4,812,477
550 4,812,478
557 4,812,479
4,812,480
647 4,812,481
649 4,812,482
721 4,812,483

CLASS 521

60 4,812,484
82 4,812,485
139 4,812,486
159 4,812,487

CLASS 522

31 4,812,488
42 4,812,489

CLASS 523

107 4,812,598
212 Re.32,889
310 4,812,491
351 4,812,492
412 4,812,493
443 4,812,490

CLASS 524

37 4,812,495
47 4,812,496
87 4,812,497
91 4,812,494
4,812,498
96 4,812,499
99 4,812,500
117 4,812,501
125 4,812,502
226 4,812,503
229 4,812,504
377 4,812,505
484 4,812,509
512 4,812,506
611 4,812,507
764 4,812,508
807 4,812,510
850 4,812,511

CLASS 525

54.11 4,812,512
65 4,812,513
67 4,812,514
69 4,812,515
83 4,812,516
94 4,812,517
100 4,812,518
101 4,812,520
106 4,812,519
116 4,812,521
153 4,812,522
162 4,812,523
194 4,812,524
232 4,812,525
240 4,812,526
250 4,812,527
326.1 4,812,529
338 4,812,528
409 4,812,530
419 4,812,531
420 4,812,532
425 4,812,534
437 4,812,533
450 4,812,535
488 4,812,537
505 4,812,538

CLASS 526

62 4,812,539
73 4,812,544
218.1 4,812,540
230.5 4,812,545
264 4,812,541
265 4,812,542
281 4,812,543
297 4,812,546
301 4,812,547
313 4,812,548
318 4,812,549

CLASS 527

201 4,812,550

CLASS 528

129 4,812,551
226 4,812,552
272 4,812,553

CLASS 530

311 4,812,554
323 4,812,555
324 4,812,556
351 4,812,557

CLASS 534

618 4,812,558

CLASS 536

27 4,812,559
29 4,812,560

CLASS 540

222 4,812,561
227 4,812,562
302 4,812,563
355 4,812,564
491 4,812,565
533 4,812,566

CLASS 544

230 4,812,567

CLASS 546

49 4,812,568
94 4,812,569
280 4,812,570
290 4,812,572
296 4,812,571

CLASS 548

151 4,812,574
260 4,812,575
362 4,812,576
404 4,812,577
544 4,812,578
548 4,812,579
561 4,812,580
953 4,812,581

CLASS 549

214 4,812,582
292 4,812,583
417 4,812,584
483 4,812,585

CLASS 556

129 4,812,586
136 4,812,587
453 4,812,588

CLASS 558

51 4,812,589

CLASS 560

140 4,812,591
180 4,812,592
183 4,812,593

CLASS 562

470 4,812,476
473 4,812,594

CLASS 564

463 4,812,595

CLASS 568

788 4,812,596

CLASS 585

443 4,812,597
467 4,812,536

CLASS 800

1 4,812,599
4,812,600

CLASS 860

137 4,812,590

CLASSIFICATION OF DESIGNS

D2— 268 300,180
314 300,181
623 300,182
D3— 38 300,183
51 300,184
D4— 102 300,185
D6— 300 300,186
368 300,187
370 300,188
379 300,189
459 300,190
514 300,191
300,192
542 300,193
604 300,194
D7— 5 300,195
39 300,196
46 300,197
308 300,198
D8— 10 300,199
30 300,200
37 300,201
302 300,202
300,203
300,204
358 300,205
373 300,206
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